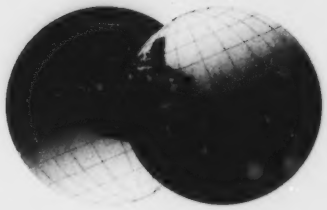

For Generations to Come

Contaminants, the Environment, and Human Health in the Arctic

Conference Report

Iqaluit, N.W.T.
October 8 – 10, 1996

Alan Saunders

CANADIAN POLAR COMMISSION

The Canadian Polar Commission

The Canadian Polar Commission is Canada's national advisory agency on polar affairs. It has responsibility for:

- monitoring, promoting, and disseminating knowledge of the polar regions;
- contributing to public awareness of the importance of polar science to Canada;
- enhancing Canada's international profile as a circumpolar nation; and
- recommending polar science policy direction to government.

Canada

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CONFERENCE REPORT

JUNE 1997

For Generations to Come

Contaminants, the Environment, and Human Health in the Arctic

Alan Saunders

CANADIAN POLAR COMMISSION

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Foreword

The depth of concern expressed by northerners for their health and well-being, and for that of generations yet to come, prompted the Canadian Polar Commission to undertake a country-wide review of the issue surrounding transboundary pollutants in the fall of 1996. Through meetings with individuals and organizations, a series of regional fora, and a national conference, *For Generations to Come*, held in Iqaluit, N.W.T., there emerged a clear consensus that action is imperative. There emerged, too, some serious misgivings about the future, about the health of northern Canadians and the means to ensure that our national commitment to environmental protection remains strong.

Programs such as the federal Arctic Environmental Strategy have demonstrated that partnerships work better than pronouncements in addressing environmental issues and helping shape policy and programs. The initiatives of the last few years have answered many questions and raised many more—questions that cannot go unanswered if our concern for future generations is genuine.

Twenty years from now may be too late to contemplate the "what ifs" and "might have beens". Now is the time for action at all levels—local, regional, national, circumpolar, and international. We must recognize that the resources available for such action may be limited, but we must recognize, as well, that fiscal responsibility in the public interest means looking to the future and measuring the costs of *inaction*. The recommendation set out in the following report reflects the need to protect the arctic environment and the health of its peoples, which are the very cornerstones of sustainable development. We believe it reflects the discussions and conclusions of the conference and is worthy of further consideration and action.

Hon. John Fraser
Ambassador for Environment
Conference Co-Chair, *For Generations to Come*

Mary Simon
Ambassador for Circumpolar Affairs
Conference Co-Chair, *For Generations to Come*

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The Polar Commission wishes to express its sincere thanks to all who took the time to attend the *For Generations to Come* conference, whether as presenters or as participants. Special thanks are due the conference co-chairs, Ambassador for Circumpolar Affairs Mary Simon and Ambassador for Environment the Hon. John Fraser.

The comments and suggestions of a number of individuals who attended the Commission's January 1996 planning meeting in Ottawa were invaluable in helping set the framework for both the regional meetings and the Iqaluit conference itself. As well, the Commission acknowledges the contributions of a number of local individuals to the success of the conference, in particular Brian Pearson of the Astro Theatre, Doug Lamm and the staff of the Discovery Lodge, Bruce Rigby and the staff of the Nunavut Research Institute, and Joan Cotton North-Cott Consulting for her help with logistics.

Finally, special thanks are due Audrey Joyal for preparation of the transcript upon which the following conference report is based.

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Setting the Context: CPC Regional Fora

As part of its effort to obtain A regional perspective on contaminants for its *For Generations to Come* conference, the Polar Commission hosted three regional sessions in the Yukon, Northwest Territories, and northern Quebec in September 1996. While the agenda for each meeting was flexible, participants were requested to address several topics to be included in the program for the subsequent Iqaluit conference: "Contaminants in Our Lives: Overcoming Uncertainty"; "Government/Citizen Management Initiatives"; "Northern Foods: Standards, Monitoring, and Consuming in Confidence"; and "Communicating with Communities".

Whitehorse, September 12, 1996

Abandoned mining and military sites and their continuing legacies were cited as a primary concern by participants at the Whitehorse forum. Recent mining initiatives have led to concern about the effects of mining methods and technologies on the land, water, fish and animals. At the same time, Yukoners are aware that airborne contamination is also significant. Concerns related to the effects of contaminants on human, animal, environmental, and ecosystem health were raised. The group made recommendations emphasizing the need for continued support and resources for research, monitoring, and community action. It was felt, as well, that First Nations must work in partnership with government to mount effective education, research, monitoring, and remediation programs. Political action at the national and international levels was viewed as necessary to promote contaminant reduction and clean up.

The systems and processes developed in the Yukon have emphasized community involvement through workshops, involvement in contaminated site cleanups, and the provision of testing data and information to communities. Community representatives also emphasized the need to focus on the training and education of youth, who will inherit the responsibility of management in the future. It was felt that resources must be used to equip them with the knowledge and information necessary to address the issues.

Participants noted that the management of contaminants requires a long-term effort. With respect to mineral development, its was suggested that baseline information be gathered to accurately assess changes and their effects; further, the results of any research and testing should be done quickly and in plain language. Participants talked of the need for a holistic approach to research, incorporating traditional knowledge and adopting an ecosystem approach. Communities and scientists must be realistic about the expectations they have of research, and through partnership, communities must be part of the process of raising questions for the research agenda.

There was also discussion about the structure of the Arctic Environmental Strategy (AES). One community representative expressed concern that the bulk of resources is not used directly by

communities; instead money is filtered down through the administrative system. Communities are given money only through specific programs on a year-to-year basis. Most of the funding supports the activities of outside researchers or the publication of technical reports that most people in communities either do not or cannot read.

Participants agreed that much work remains to be done in the area of contaminants. The AES has succeeded in defining what the problems are, and has put in place basic infrastructure for research, community involvement in the process, and remediation. Maintaining established capabilities is necessary to ensure that the issues continue to be addressed. This is true not only for local-source pollution but also airborne, transboundary contaminants. At the same time, new questions and issues are bound to arise which will require attention and resources.

Standard setting is an area where more work needs to be done. From a community perspective, the lifestyles and eating habits of First Nations people must be considered to obtain an accurate picture of what kinds of standards are required. Standards are set by toxicology experts and are based on animal models with conservative approaches; however, it may be necessary to go beyond laboratory models, to incorporate nutritional and socio-economic factors in the development of realistic standards.

Both community and government participants agreed that scientific information must be delivered to communities in plain language. Both the message and the messenger must be trusted to be effective; partnerships between scientists and communities should address this issue. It was suggested that First Nations be allocated resources to determine what information is needed and how best to communicate it. Participants agreed that an effective overall communications strategy begins locally and works outward: issues must be approached in terms of how local concerns fit with those of the area's First Nations, and then move on to regional, national, and international levels. Once the problem is identified and understood, action can be taken.

Yellowknife, September 19, 1996

The presence of contaminants in the North has caused uncertainty: people see changes in the land, water, and animals, and want to know if certain species are safe to eat. Educating people about benefits and risks, and making available reliable, balanced information can help them make informed choices. Participants at the Yellowknife forum emphasized the need for continued support and resources for research, monitoring, and community action. There was also a call for continued partnerships based on the model developed co-operatively under the Arctic Environmental Strategy (AES).

Communications and education were cited as important issues. With respect to terminology, it was noted that issues relating to contaminants are not easily translated in either a linguistic or conceptual

sense. Finding everyday language to convey complex ideas is a challenge; it is important, as well, that the cultural context be taken into consideration.

A number of methods have been used to educate people about contaminants. In the case of the AES, a co-operative partnership approach has proved successful in developing research studies involving the community. For example, the Métis Nation of the Northwest Territories has focused its efforts on educational institutions, including elementary schools, high schools, and Arctic College. Testing is currently underway on a contaminants curriculum for use in schools throughout the Territories. The goal of the project is to build the capacity of youth to understand concepts, and to implement a long-term program that can be regularly updated to reflect the changing situation. A database of research conducted under the AES program has also been developed; this will allow people to access information as studies are completed. It will also enable them to respond to questions and to contact researchers and experts.

The N.W.T. Technical Committee on Arctic Contaminants was established in 1989 by the Territorial government to identify priority issues and assume the lead role in developing information and communications. The results of all contaminants studies in the Northwest Territories must be released through this committee to ensure that information is accurate and balanced. Committee partners have developed a variety of resource and educational tools, including workshops, videos, posters, and nutritional fact-sheets. Committee membership includes representatives of Aboriginal organizations, and federal and territorial governments with an interest in the contaminants issue.

Balanced information allows people to make decisions about risks and benefits. In general, the benefits of consuming traditional foods outweigh the small known risks. However, when risks are considered to outweigh benefits—which has happened in some cases—that information is also made available. Risk/benefit assessment also requires that nutritional, economic, and cultural factors be taken into consideration. While it is important to accurately measure and assess risks, these should not be overemphasized at the expense of the known benefits.

Giving people definite answers about the health risks of consuming contaminants is difficult because our knowledge about the combined effects of these chemicals is extremely limited.

Studies suggest that contamination in the Arctic tends to be about 10 years behind trends in the South. In some cases, contaminants coming into the Arctic are decreasing, reflecting cessation of use in the South. However, little information is available on the rate at which contaminant levels in the Arctic would decrease if the global use of pesticides were to be curtailed; only through long-term study can these answers be found. On the other hand, some contaminants—for example, mercury—are being found in higher amounts in the Arctic atmosphere. This raises concerns because increases in atmospheric contamination will eventually be reflected in fish and animal species.

Many factors make traditional food consumption a sensible choice, from a nutritional, cultural, and socio-economic standpoint. In many isolated communities (and even those linked by roads to the South) healthy and affordable alternatives to traditional foods are few. Thus, when research is done in response to community concerns, findings should be delivered in a way that makes it clear that it is not the foods themselves which are bad; it is the contaminants. Furthermore, contaminants sometimes only affect very specific parts of the animal. The media has an important role to play in ensuring that the message is portrayed responsibly.

Kuujjuaq, September 27, 1996

At the Kuujjuaq forum, recent mining and exploration initiatives, such as Voisey's Bay and the Raglan Mine, have led to increasing concern about the effects of contaminants on human, animal, environmental, and ecosystem health. It was suggested that any future national program directed toward the Arctic environment should include Labrador and Arctic Quebec, consistent with the generally accepted definition of "Arctic". Political action at the national level to promote contaminant reduction and clean-up was also recommended.

In Labrador resources have recently been secured to begin basic research on lifestyles and people's observance of changes taking place in the local environment. For example, the Labrador Inuit Association's environmental health study has collected reports on abnormalities in caribou, seal, and seabird eggs. The first eco-research office in Labrador opened two years ago, with funding from the Arctic Environmental Strategy (AES) and the province; the facility is currently conducting a cord-blood monitoring program, testing for mercury, organochlorines, and other substances along the lines of studies underway in other parts of the North.

Contaminants research has been underway in Nunavik for a number of years. The Nunavik Health and Nutrition Committee is now working with the University of Waterloo on the development of a communications strategy which will provide information about nutrition, contaminants, and the benefits and risks involved in making dietary choices.

In discussing contaminants, people tend to focus on the effects of pollution originating outside the area; however, many sources of contaminants exist locally—diesel generators, four wheelers, ski-doos, and cars. Pollution produced within the area often stays in the area and is not disposed of properly. Poor planning often leads to dumps and sewage disposal in areas close to communities, affecting the environment and contaminants entering the ground water. Incineration of garbage at dumps also results in smoke containing unknown substances.

Extensive hydroelectric development took place in James Bay during the 1970s. The creation of hydroelectric reservoirs intensified the methylation of inorganic mercury into methylmercury; once transformed, the methylmercury enters the food chain. In 1986, Hydro-Québec and the Quebec

government, along with the nine Cree communities of the James Bay region, signed an agreement to monitor exposure levels in the Cree population.

Community health workers were frequently identified during discussions as important resource people in the communities. Many of these people are well known and trusted by the community and have already established consistent contact and trust with various sectors of the community. Such individuals must be provided with training so that they can respond to concerns and direct people to other sources of information.

Participants had a variety of perspectives on the issue of regular monitoring of country foods. Some felt that establishing such a system would raise unnecessary concern. For others, any system would make no difference, since many people—elders, in particular—would continue eating traditional foods. As well, any system would have to take into account the seasonal nature of northern foods, in contrast to the situation in southern Canada.

In Nunavik and Labrador, there is frustration over the fact that the AES does not extend to the northern parts of the provinces; the immediate consequence is that only limited resources are available for environmental issues. As a result, local municipalities and governments must take action to deal with the more benign contaminants and irritants which affect human health directly. Proper piping system for drinking water, paved roads to eliminate dust, and proper sewage treatment facilities are examples of infrastructure which would ensure a basic standard of environmental health in every community.

For Generations to Come
A Canadian Conference on Contaminants, the Environment, and Human Health in the Arctic

Introductory Remarks

Hon. John Fraser, *Ambassador for Environment (Conference Co-Chair)*
Mary Simon, *Ambassador for Circumpolar Affairs (Conference Co-chair)*

Hon. John Fraser, Canada's Ambassador for Environment, welcomed participants to Nunavut and to the *For Generations to Come* conference. He spoke of the conference objectives and of the need for critical review of national initiatives such as the Arctic Environmental Strategy (AES).

"We want to know if the expectations we set five or six years ago were reasonable," he said. "Have we accomplished what we set out to do? What have we learned about the effects of contaminants on northern ecosystems and human health? Perhaps most importantly, is there unfinished business on the research agenda?"

Ambassador Fraser said a primary goal is to eliminate the uncertainty that northerners have been forced to contend with when it comes to contaminants and related health effects. Thus, part of the effort must be to ensure that northerners have the information they require to make informed choices.

"We have to make research accessible, we have to make it relevant to peoples' lives, and we have to be willing to build bridges for knowledge among regions, jurisdictions, and disciplines," he said. "The longer I have been involved in public life, the more I have become convinced that no one person or organization can claim ownership of the environment as an 'issue'. It is simply too important a matter to be treated as a political football. Some people may say that is inevitable in today's society, but I think—I hope—that we can rise above such thinking to see the consequences of that kind of parochialism."

> *"We're here in Nunavut today because we know that there is something unique about this part of the world and about northerners' close relationship to the environment. It seems to me that's a pretty sound approach and a big improvement from the days when environmental policy, such as it was, never looked beyond the nearest border. But at the same time, I want to remind everyone that there is a 'big picture' out there. Northerners have to deal with the fact that a variety of contaminants have found their way into arctic ecosystems, but so do Canadians living in the Fraser Valley, by the Great Lakes, or along the St. Lawrence Seaway. At the risk of turning the 'think globally, act locally' maxim on its head, I suggest to you that this is a problem with which we must cope on a regional level but which we can only hope to solve on a global scale."*
>
> —Hon. John Fraser

Mary Simon, Canada's Ambassador for Circumpolar Affairs, said the issue of contaminants hangs over the future of Aboriginal northerners, causing them to question the viability of traditional lifestyles.

"The topic we are examining is a very, very important one for Aboriginal peoples, not only in Canada but throughout the international Arctic," said Ambassador Simon. "In some cases, contaminants pose a potentially serious risk to families who rely on country food for a substantial portion of their daily diet. In other cases, we have been advised that the risk is small or related to long-term consumption of certain fish or animals. But even if the risks are negligible, Aboriginal people are right to ask questions about the future. For example, will the so-called 'high-risk levels' of today become the 'acceptable' levels five, ten, or fifteen years from now? Are we supposed to accept the idea that contaminants are here to stay? That we should simply live with the consequences?"

Ambassador Simon noted that the recent launch of the Arctic Council will help Canada and other countries in promoting environmental protection in the circumpolar region, but she cautioned that any efforts in this regard will be measured largely by the commitment of Canadians to environmental protection within their own borders.

"That kind of leadership role brings with it a great deal of responsibility and high expectations," she told participants. "We must now follow through on our commitments and ensure that the message we deliver to our Arctic neighbours reflects a national consensus on northern priorities. Certainly the issue of contaminants will be at or near the top of that list. But we should not fool ourselves into thinking that *our* priorities automatically become those of the Arctic Council. Just as Canada consists of various regions and interest groups, so too does the Council represent a broad sweep of peoples and cultures."

Keynote Speaker

Dr. Theo Colborn, *World Wildlife Fund*

Theo Colborn, of the World Wildlife Fund, described for participants her organization's efforts to raise awareness of the potential damage to wildlife populations from pollutants. Although the WWF does "second-order science", collecting and interpreting research done by others, it has succeeded in compiling an extensive global database on pollutants and their potential health effects.

Dr. Colborn spoke of studies carried out in the Great Lakes/St. Lawrence region, and of the growing body of scientific evidence pointing to serious health effects from regular exposure to environmental contaminants.

"As I looked out the window of the plane as we flew in today, I was reminded of the vital role the Arctic plays in restoring the integrity of the global environment," she said. " It is the source of fresh

water and the birthing ground for millions of birds. Chills ran up and down my spine when I thought of the contaminants that I know are coming this way, in air, water, and through commerce."

Dr. Colborn reminded Aboriginal northerners that they have a right to ask questions about contaminants. Noting the important role wildlife studies have played in helping determine contaminant pathways, their influence on the food web, and, ultimately, their effects on human health, she suggested that the land-based traditions of northerners may afford them a unique perspective on the problem; however, she warned against a reliance on regional approaches that may lose sight of the need for global action.

"You cannot resolve the problem of contamination in the Arctic alone," she said. "Your nation must become a vocal partner in an international effort to phase out the production and use of persistent chemicals and other biologically active chemicals that can undermine living systems and threaten future generations. Your voice is needed to achieve this goal."

Through a series of slides, Dr. Colborn illustrated the effects of chemical pollutants on a variety of species in the Great Lakes region. Despite clean-up efforts in recent years, evidence of severe endocrine effects continue to be observed in Great Lakes fish stocks and bird populations; for example, salmon and trout have enlarged thyroid glands—in some cases, so large that they burst—and male salmon are often unable to reproduce because they do not reach sexual maturity. Dr. Colborn described similar effects in herring gulls and tern; for example, a 1983 study indicated that chick loss was largely attributable to a lack of parenting—in essence, colonies were comprised of female/female pairs.

Dr. Colborn said early indications that similar dysfunctional effects may be found in humans prompted several scientists to collaborate in producing *Our Stolen Future*, a work that has become a best-seller in its field.

"They also produced a "Consensus Statement" in which they were certain that a large number of man-made chemicals have been released into the environment that have the potential to disrupt the endocrine system of animals, including humans," she noted. "They also warned that unless the environmental load is abated and controlled, large-scale dysfunction at the POP level is possible."

Although human health problems linked to contaminants are varied—and may be difficult to detect—a clearer picture of the effects of chemicals on the human endocrine system has emerged in recent years:

- Glands and the brain produce chemical messengers that travel in the blood to tissues and other organs where special receptors wait to be turned on. These receptors help the body

carry out a range of daily functions (e.g., respond to stress, regulate body temperature) as well as ongoing processes (e.g., maturation and development, aging).

- Chemicals can interfere with the function of the brain and endocrine system by penetrating the placental barrier and scrambling the instructions of the naturally produced chemical messengers. The latter tell a fetus how to develop in the womb and post-natally through puberty; should interference occur, immune, nervous, and reproductive systems may not develop as programmed by the genes inherited by the embryo.

"We realized suddenly that the tests we had been using were too crude," explained Dr. Colborn. "We had looked for obvious effects, such as visible birth defects, cancer, death, and acute toxicity. We needed new tests to detect delayed, long-term functional deficits."

Dr. Colborn said the growing evidence from wildlife studies, and the potential risk to humans, should be more than adequate to convince sceptics of the need for action.

"There is adequate evidence that something is taking place of global proportions," she suggested. "The scientific message grows louder every day. The story is breaking, article by article, in the most reputable, well-respected scientific and medical journals in the world—*Science, Nature, the New England Journal of Medicine, the British Medical Journal*. Wildlife and human behaviour, intelligence, immune competency, and reproductive success are at risk."

While Dr. Colborn acknowledged that progress is being made on a number of fronts—for example, improved testing procedures, cleaner technologies, and international protocols—she emphasized that the time has come to stop the "global experiment using wildlife and humans as guinea pigs".

"For you, living in this most fragile and spectacular ecosystem, it is imperative that you continue to maintain an active voice at the international level and demand that the research required is done, to turn our attention to those in the womb and the egg, the most vulnerable among us, for generations to come," she told conference participants. "Let us reaffirm their birthright to reach their fullest potential. Let us work for the day when our children are born free of man-made chemicals."

Keynote Speaker

Dr. Derek Muir, *Department of Fisheries & Oceans*

Derek Muir, of the Department of Fisheries and Oceans, presented participants with an overview of contaminants in the Arctic, highlighting five main areas: contaminants of concern; current research on pathways; spatial trends; biological effects; and knowledge gaps.

Dr. Muir focused his remarks on polychlorinated biphenyls (PCBs) and other organochlorines (e.g., toxaphene, DDT, dioxins). He explained that contaminants such as heavy metals (e.g., mercury, lead, arsenic, cadmium), and radioactive isotopes (e.g., Strontium-90, Cesium-137), while also important in the arctic environment, are more difficult to work with because they involve both anthropogenic and natural processes.

With reference to contaminant pathways, Dr. Muir explained how air and ocean currents carry contaminants to the Arctic from distant parts of the globe. A key factor is the movement of water from the Atlantic Ocean through the Canadian archipelago to the High Arctic; the upwelling of this "older" water in the Arctic Ocean and Beaufort Sea may help explain how industrial or agricultural chemicals used decades ago are only now being detected in regions of the High Arctic.

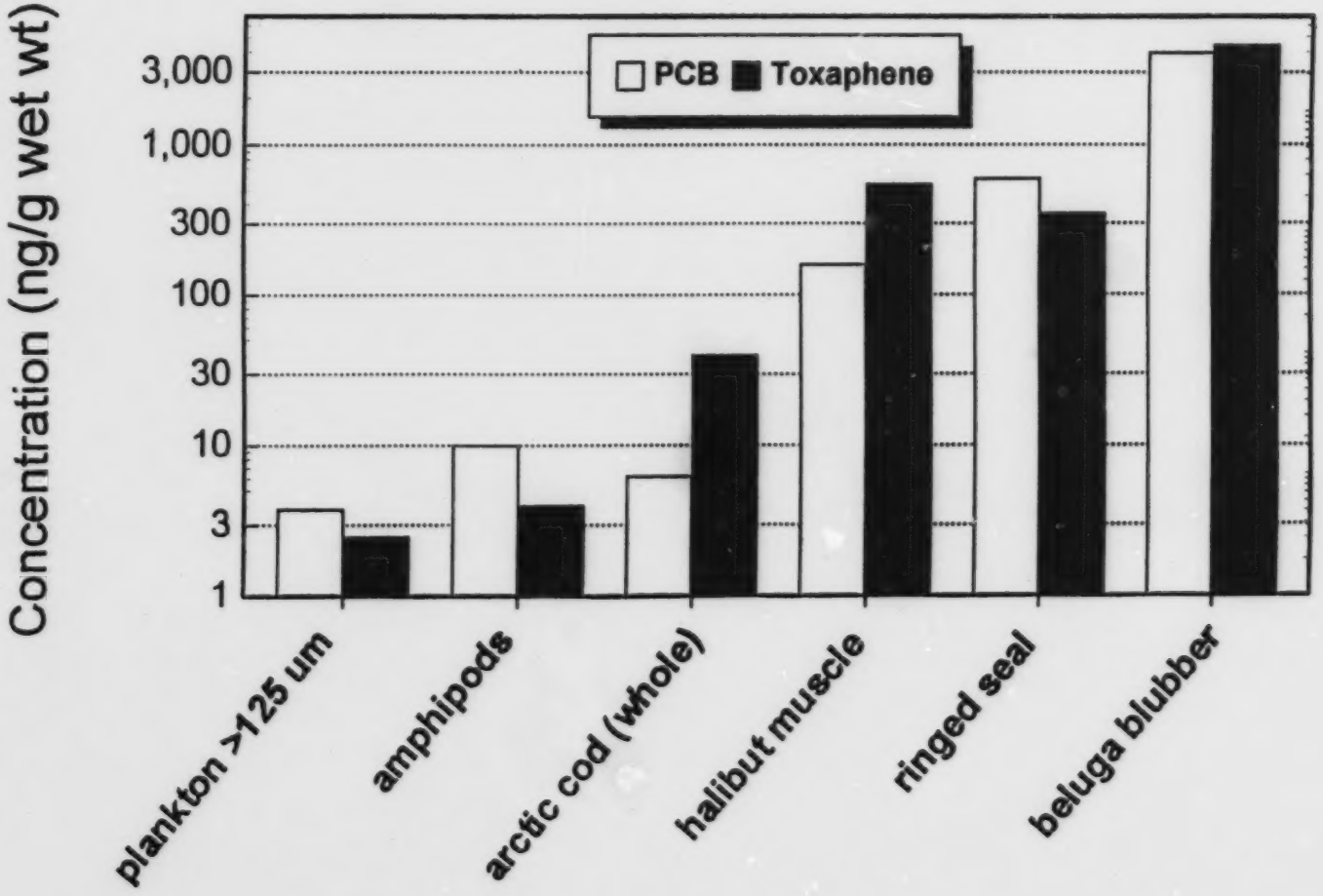
Another factor is the process known as "cold condensation" whereby chemicals used in temperate regions tend to evaporate from the soil, particularly at high temperatures, and are transported in the atmosphere as gases and then precipitated back to ground level where they are reabsorbed by soils or vegetation. Highly volatile chemicals, such as hexachlorobenzine, can actually move long distances via this process, known popularly as the "grasshopper effect".

"Because the polar region is colder, because there is less degradation, it is theorized that the chemicals are going to move gradually in that direction—a bit like the fact that the poles have ice caps that tend to remain there," explained Dr. Muir. "Whether this is really all true is not known for sure, but there is evidence that this is happening to some extent."

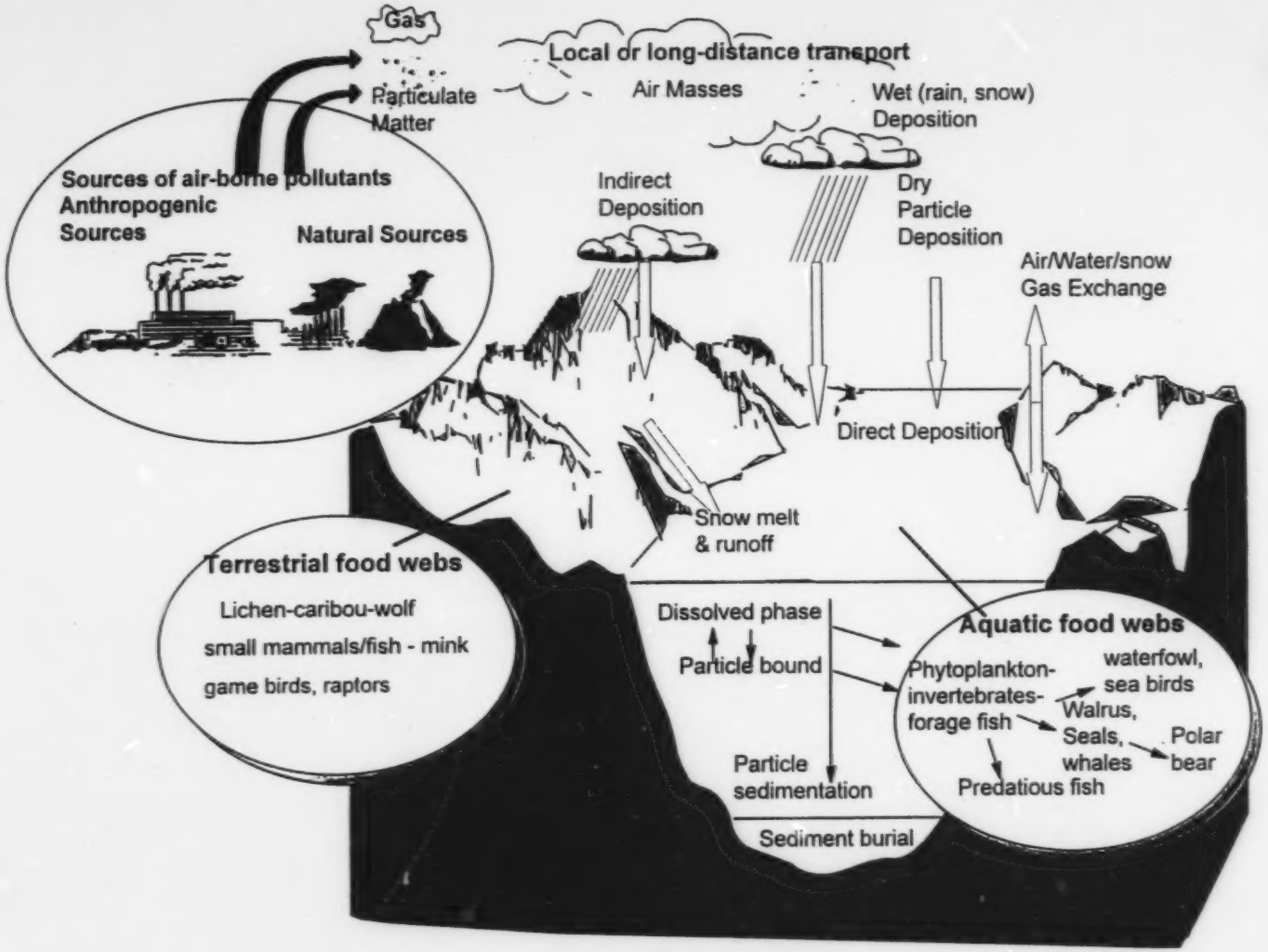
Dr. Muir said increased monitoring of the arctic environment over the past five years has provided scientists with much clearer evidence of contaminant sources than was previously available. For example, air samples taken from the Canadian North and Norway have tracked pollution entering the Arctic from Russia and parts of Europe, as well as the U.S. Pacific Coast. The north-flowing rivers of Russia and, to a lesser extent, North America are also a significant source of pollutants such as HCH and toxaphene. Glaciological research has also been effective in showing the contribution of snowfall to the transport and deposition of contaminants.

Turning to the uptake of contaminants in the Arctic food web, Dr. Muir explained how chemicals are absorbed by marine and freshwater organisms which form the primary food supply for fish and other species. In the case of terrestrial animals, chemicals may be absorbed by lichens or other plants which, in turn, are eaten by mammals. Determining the primary sources of contaminants for any particular species is an extremely complex process; regional variations are sometimes difficult to explain and may be due as much to local factors as long-range pollution. In general, results for fish species in the Canadian North suggest that contaminant levels are quite low when compared with those from other parts of the world; however, research data on marine mammals such as beluga, seals, and polar bear do seem to indicate cause for concern, particularly when non-organics—heavy metals such as mercury and cadmium—are also taken into account.

Concentrations of PCBs and toxaphene in the east/central Arctic marine food web

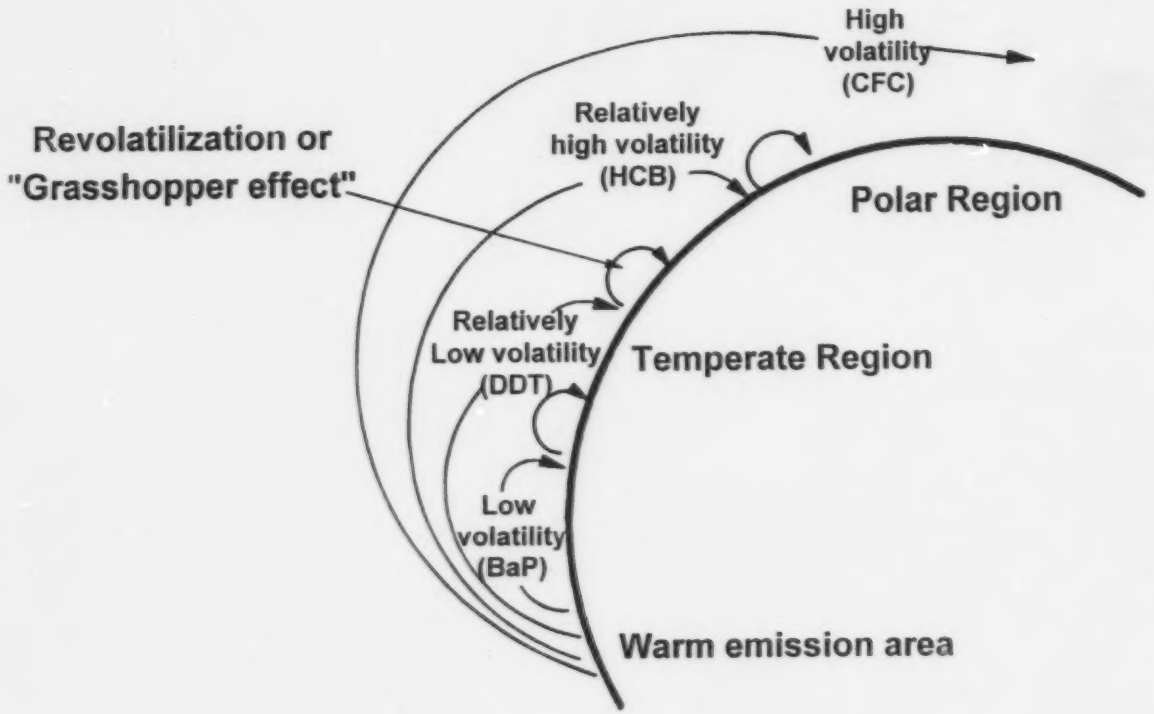


Results for plankton and amphipods from Hargrave et al 1992



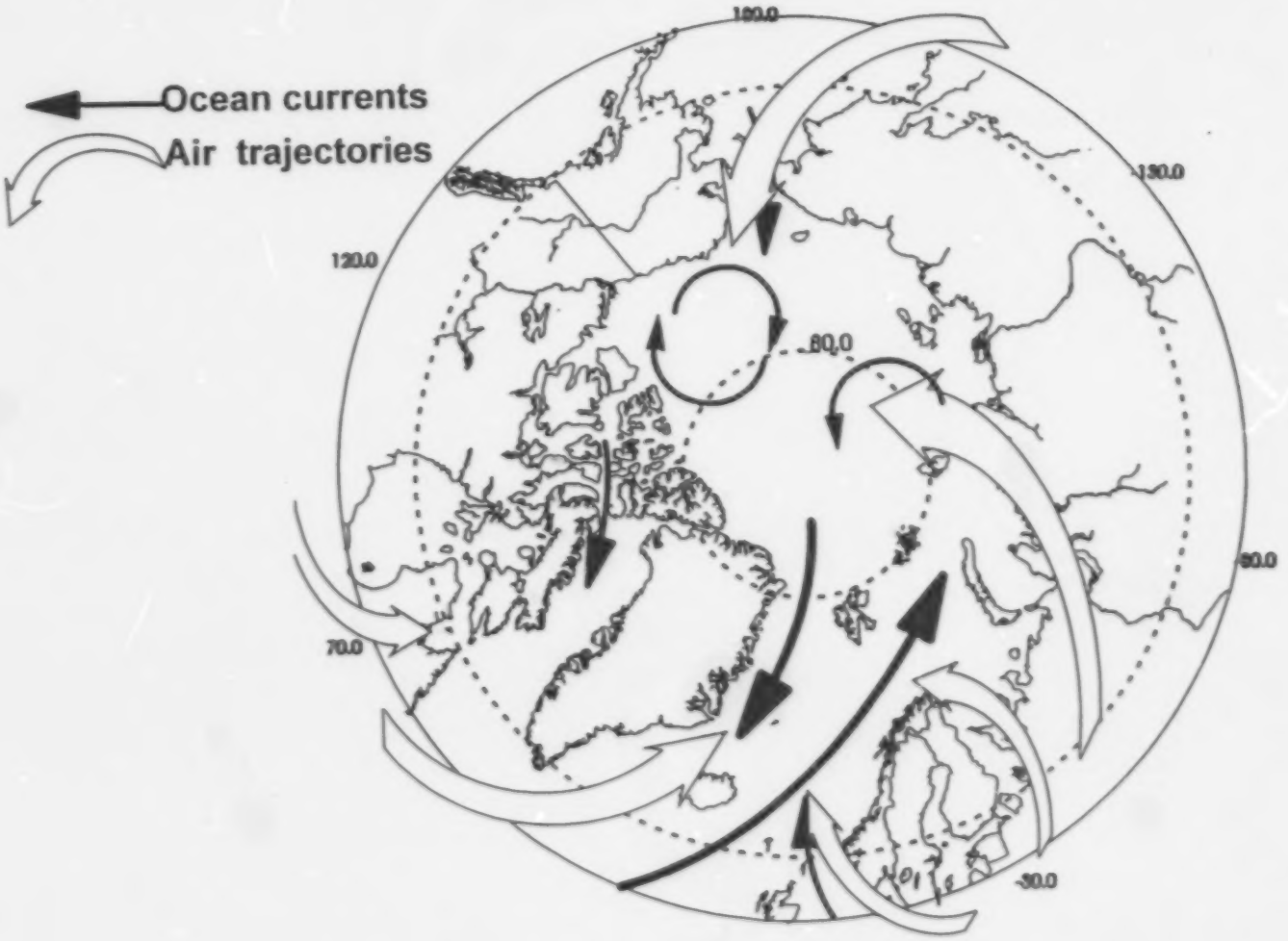
Pathways of transport and accumulation of persistent organics and metals to Arctic freshwater and marine ecosystems

Cold condensation and fractionation of semi-volatile organic compounds with latitude (Wania and Mackay 1994)



In a process resembling distillation organic chemicals become latitudinally fractionated according to their volatility as they condense at different temperatures

Pathways of long range transport of contaminants to the Arctic



Dr. Muir highlighted current gaps in scientists' knowledge of contaminants, saying additional research will be required to answer questions relating to health effects and the toxicology of specific contaminants, such as mercury, on arctic species.

"We really do know a lot about the pathways and prevailing levels," he revealed. "But we cannot answer the question, 'Are things getting better or worse?' I am exaggerating a bit. We obviously can address the question, but we don't have a solid answer so that we can say things are getting better or worse, and we really need to work on that, I think, to address some questions people in the North have."

"Two unique studies have been done which deserve mentioning, and both got some sort of similar results. In one case, Letcher et al. studied polar bears at Churchill, and they managed to get a level of enzyme activity; they were also able to measure the concentrations of PCBs and dioxins and other contaminants, all of which induce the activity of this enzyme. They got this quite significant relationship, showing that there was a response by the bears to the pollutants. We can't say what it was really doing to the bears, but we do know they were responding. The same was shown in a study by White et al., a group which included Lyle Lockhart from the Freshwater Institute. These colleagues collected samples from beluga whales at the Eskimo Lakes near Tuktoyaktuk. The unique thing about this whale population was they were ice-entrapped and they were there part of the winter until they were shot by hunters and we were able to get samples immediately upon the hunting being completed. The whales were starving; you could see photographs showing that they had lost a lot of fat mass and they had a bony looking structure—very unusual for beluga. They were mobilizing all that PCB and fat, of course, that normally is not mobilized quite so fast as when they are ice-entrapped. They got this relationship, in any case, between enzyme activity in the liver and concentrations of PCBs in the fat of the animal. But, when they went back the following years, with the co-operation of the Inuvialuit settlement region (they have, in fact, been studying it for several years in a row), normal healthy beluga did not show this response. It was only when they were mobilizing the fat that they got it, so it could be that starvation, the exposure to some of the realities, difficulties of the arctic habitat, might be the trigger that would set off some sort of effect with these animals. Maybe they can handle, carry around this burden with them normally; I am not sure."

—Derek Muir

Comment

Conference Co-Chair Mary Simon said Dr. Muir's presentation underscored the need for continued support of research directed at the effects of contaminants on plants and animals. She noted that the issue is a pressing one, given the scheduled 'sunsetting' of AES programs in fiscal 1996–97.

Roy Koerner, of the Geological Survey of Canada, offered information on temporal trends gathered from snow samples taken in northern Ellesmere, and dating back more than 8000 years.

"I think it shows quite dramatically the effect of human beings on the environment," he said, referring to the data. "For about 8000 years we've just got the volcanic eruptions coming in—a very big one from Iceland, for example—and then 100 years ago the anthropogenic pollutants come in. The interesting thing is that they come in 100 years ago, but only about 40 years ago in northern Ellesmere. Right now, we think that the pollutants might be coming from the South; in northern Ellesmere, they are coming over the top from the North."

In response to questions on research priorities and funding, Dr. Muir suggested that temporal trends are a key consideration, given the nature of northern species.

"We have to build in a commitment to do that over quite a long period of time," he said. "A whale takes five to ten years to clear its system—maybe longer. In the St. Lawrence, we are seeing evidence for the first time of a decline in PCBs in belugas, even though emissions from open use of PCBs stopped in that region long ago. So, clearly, it takes a long time for a long-lived animal to show a change. We have got to make a commitment if we are going to study those species over a long period of time."

Dr. Muir noted, as well, that scientists lack important information on biological effects, a shortcoming attributable in part to constraints imposed by current research programs.

"Theo Colborn's entire thesis has been missed by us in our program, partly because it has developed over the past five years, and we didn't have the flexibility in our program to turn around and look at some of these hormone/endocrine destructor issues," he said. "We didn't get into this whole issue, and I think it is one worth looking at...So, I would say that, on the biological effects question, we need to somehow have the ability in our program to look at more exposed populations, so that we can understand what might happen to arctic animals if concentrations are not going to go down or were actually increasing."

Ken Yuen, of the Department of Fisheries and Oceans, reiterated several of the points made by Dr. Muir with respect to research funding and support, adding that knowledge gaps exist in a number of

areas, most notably long-term trends, contaminant effects on northern species, and basic ecosystem information.

"Last year and this year, as we are winding down, we have been phasing out some of these contaminant studies and phasing in more of the human health studies which were not started in the beginning," he explained. "What did we achieve in five or six years? Basically, we have obtained a picture of the spatial distribution of a number of chemicals. We have not got very far on effects or on the temporal trends. So, just looking at it in very general terms, it would be desirable to have a program of scientific research on the effects of contaminants and temporal trends. I would hope that somebody would be kind enough to have a 'son of NCP' at about the same level funding, because that would be the order of magnitude needed."

Panel Discussion
"Contaminants in Our Lives: Overcoming Uncertainty"

Chair: **JoAnne Deneron,** ***Canadian Polar Commission***
Panelists: **Mary Sillett,** ***Inuit Tapirisat of Canada***
Norma Kassi, ***Council of Yukon First Nations***
Minnie Grey, ***Nunavik Regional Health Board***
Ben Kovic, ***Nunavut Wildlife Management Board***

Commission Co-Chair JoAnne Deneron reviewed the discussions from the Whitehorse, Yellowknife, and Kuujjuaq fora in September, noting that participants emphasized the need to:

- maintain a viable public-sector research capability;
- incorporate local priorities and capabilities into research and remediation programs; and
- promote education and training programs at the community level.

Mary Sillett, President of the Inuit Tapirisat of Canada, said the issue of contaminants has been a unifying force for Inuit, who depend on marine mammals for subsistence.

"There is widespread recognition that country foods are more than just the most nutritious source of sustenance for Inuit in the Arctic," she explained. "They are part of a seamless web that binds us as a people. Th hunting, preparing, eating, and sharing of country food is an integral part of our identity, and anything that adversely affects that part of our life adversely affects us as a people."

Ms. Sillett said the establishment of common standards across federal, provincial, and territorial jurisdictions would be an important step forward in dealing with contaminants and what she termed the "unique vulnerability" of Inuit to related health problems.

"Health Canada's level of concern...is not a fully accepted standard," she noted. "Quebec, for example, uses a different, higher level which, if it was applied to the Kitikmeot study, would have changed the meaning of the results. We believe this lack of a common standard is not acceptable. We therefore call upon the different jurisdictions to come to the table as soon as possible, preferably before more studies concerning the Inuit are completed, to reconcile this problem. We wish to be full partners in any such discussion, because its outcome concerns us directly."

"Now, more than ever, governments such as our own need to show leadership with regard to contaminants. We trust that, even in an era of declining financial resources, our political leaders in the South will be prudent enough to see past fiscal problems and initiate concrete steps, in partnership with us, to stop the flow of contaminants to the North and into our food chain.

"While we can communicate this message to governments through our own channels, any additional support we can get from bodies such as the Canadian Polar Commission would be welcome.

"Contaminants affect everyone—but few more than Inuit. Let us work together to address and fix this problem today so that our children and grandchildren will continue to derive good health from something which is part of us, as Inuit...the hunting, preparing, eating, and sharing of country food, and the land and environment on which we depend."

—Mary Sillett

Ms. Sillett suggested that the partnership approach employed under the Arctic Environmental Strategy has proved effective in helping Inuit make informed choices about the foods they eat. As an example, she referred to the acknowledgement last year of the presence of contaminants in country food across the Arctic.

"Government officials could have made that information available unilaterally, without consulting Aboriginal organizations," she noted. "But the existence of this partnership allowed for the development of a respect by government officials of the rights of Inuit to do things our way."

Norma Kassi, Arctic Environmental Strategy Co-ordinator with the Council of Yukon First Nations, spoke of her home community of Old Crow in northern Yukon. She described a life that was "hard, harsh sometimes and very secure a lot of times".

Ms. Kassi said only in recent years have people in the Yukon begun a concerted effort to identify contaminated sites and pollution sources. Those studies have turned up a wide variety of

environmental contaminants, many originating with military installations, construction of the Alaska Highway and rail corridors. A prime example is Lake Laberge, near Whitehorse, where PCB levels are extremely high in comparison with other locations in the territory. To better understand the

"I am from the Wolf clan, to tell you a little bit about myself. I was raised amongst the lakes in the Arctic; 'Vuntut Gwitch'in'—'people of the lakes'. My community is called Old Crow; in my language it is called 'Tachik'—'meeting of two rivers', the Porcupine and the Crow.We live in the most northerly community in the Yukon, very much in the Arctic. In the Yukon Territory there are seven linguistic nations, and there are approximately 7000 Aboriginal people. I was raised on the land, mostly by my grandfather and my mom, during which times life was hard—harsh sometimes—and very secure a lot of times. I have also experienced times of famine as well, times when we had very little food on the land. When my grandpa would go out for the first hunt I would always run and meet him halfway. When he was coming across the lake, I could tell he had a big load. The first thing that he would give me would be some caribou's insides. The next thing we would do is cook the insides of the caribou, the very soft and tender parts that digest fast, because we'd been hungry and hadn't had meat for a long time—the liver, the kidneys, and the insides where all the nutrients are. And those are the first things that we would have to eat. We would eat that for two days, and after that we would begin to eat the other parts of the animal. Those are the very parts that have sustained my people for thousands of years, and we are being told now not to eat. But are we going to listen? Probably not, because we can't. We have no other source of food. I remember those times on the land when my grandfather used to take me for a walk, and we would sit on the shore of the lake sometimes after we'd seen our traps or we'd gone in our canoes around the lakes to hunt muskrat. We'd sit down, have tea, and I would lie beside him and he would tell me stories. He would say, 'You know, one day there is going to be only the loon out there.' We live in Old Crow Flats, we live with thousands and thousands of migratory birds that come up there to lay their nests. We call our lands 'the sacred place where life begins' in our language—that's where all the migratory animals come from all over the world to have their young ones. He would tell me, 'You know, the lake's all black with birds now, and one day when you are here by yourself you are going to see just the loon out there.' And, sure enough, that's what it is like out there now in the Arctic where I was raised. You see a pair of loons. They are lonely. There are no other birds around—there are very few. I used to say, 'Well, why would that happen, how come?' He would say, 'There will be poisons from the sky. The water will be poisoned. The animals will die because of all of this. There is going to be fast changes, and they are going to be when you are a woman.' And, sure enough, that's what it's like out there now. Our animals, our plants, our things are burning, and they are just not there any more, not as abundant as they used to be when I was growing up. We are facing environmental changes that are very evident. Every year, where I was raised, lakes are disappearing. Lakes that I used to play on and canoe on are no longer there; they are changing fast. I guess now we say that is attributed to global warming. In the past four years, I have begun to really learn a lot about where those poisons are coming from, an opportunity that I took on as being the co-ordinator for the Arctic Environmental Strategy in the Yukon Territory, and I have learned a tremendous amount of stuff from people."

—Norma Kasai

effects of contaminants on the environment, Ms. Kasai began interviewing First Nations elders, seeking information on the changing taste of species, the location of communities and resources, and the sources of concern. Her findings told a disturbing story, but also pointed to the importance of linking action at the community level to policies and priorities at the national and international levels. Education, she noted, is a key part of the process.

Ms. Kasai cited the Centre for Indigenous Peoples Nutrition and Environment (CINE) at McGill University in Montreal as an important component. Established under the Arctic Environmental Strategy with direct representation from Canada's major Aboriginal organizations, CINE tests northern foods for nutritional benefits and contaminant levels. At present, research suggests that nutritional benefits outweigh the risk from contaminants; however, research is continuing in response to widespread concern in northern communities about an apparent increase in the incidence of diseases such as cancer and diabetes.

Minnie Grey, General Manager of the Ungava Hospital in Kuujjuaq, Quebec, recalled the panic caused several years ago by the revelation that breast milk samples taken from Inuit women contained higher-than-anticipated levels of polychlorinated biphenyls (PCBs). Although the incident provoked heated debate about the accuracy of research, it also did much to raise awareness of the issue and highlight the importance of education and communications. In the years since, authorities in the Nunavik region of northern Quebec have initiated a number of programs to address local health and nutrition issues; most importantly, these programs recognize that food is central to the Inuit way of life.

"The history of contaminants in our food has created uncertainty, and it is really not fair that our food has to be contaminated, especially in an environment as pristine as our land. Communities and organizations, local, national and international, and governments have to make every effort to send that message—that use of pollutants can no longer be accepted or tolerated. We really do have to make that appeal to the international community. I mean, can you imagine the millions of dollars that a popular fast-food restaurant like Macdonalds would lose if there was ever any question of contaminated Big Macs? There would be instant outrage by people all over the world, in major cities such as Moscow, Vancouver, Tokyo, Toronto, Montreal, Paris, Amsterdam, just to name a few. Because there are so many people out there, their voice would be heard. Is it because Inuit number so few that it is acceptable to keep their food contaminated?

"I think that is why, through the creation of committees like the one we are trying to utilize, the Inuit of Nunavik intend to be heard. We will work along with the experts in their field and strive to develop a risk management and communication procedure so that our people are at least well-informed. Our food is our way of life. Who knows what will happen in 5, 10, or even 20 years from now with food contamination? I want my children, then their children, to continue to eat healthy foods, because part of their identity will always be their link to the land and its animals."

—Minnie Grey

Ms. Grey said communication is "the most important part of research" and should be developed at the local level. With the proper information, people in northern communities can decide for themselves the balance between nutritional benefits and contaminant risk.

Ben Kovic, Chairman of the Nunavut Wildlife Management Board, described his people's attachment to country food as an "addiction" that will likely prove impervious to government warnings or field studies. Noting that scientific or technical jargon is often an ineffective means of reaching the average citizen in the North, he stressed the need for information about contaminants to be developed at the local level. Mr. Kovic was also critical of current procedures for research reporting, saying public agencies engaged in gathering data must consider their responsibility for making information more readily understood.

"No single government department seems to be in charge of telling us what the whole story is," he said. "For example, the Department of Fisheries and Oceans does a study to determine the level of contaminants in the seal, but they do not consider their responsibility to say what these levels means for humans...How does a user like me get to know that there is a contaminant, that there is a danger?"

Mr. Kovic said northerners require clarity if they are to make informed choices about country foods. While most recognize that the threat posed by environmental contaminants is real, there is a danger that incomplete information will lead many to misinterpret the level of risk involved.

"We listen to the radio about PCB levels in humans," he said. "It's pretty high. We all jump to the conclusion all of a sudden that women can't breastfeed. I don't think we should jump to conclusions. I think we should take a step back and really think what we should be doing."

Comment

Conference Co-Chair **Mary Simon**, Canada's Ambassador for Circumpolar Affairs, reiterated for conference participants the main themes raised in the "Contaminants in Our Lives" panel:

- the desire for clear, non-technical information on contaminants at the community level;
- the need to co-ordinate standards for research and the interpretation of data at the national level; and
- the importance of allocating adequate resources to northern communities for environmental management and communications.

Chief Ed Jack, an Elder from the Taku River Tlingit First Nation in Atlin, B.C., spoke of the environmental problems associated with mining in the Taku Valley of northern British Columbia. He described how his small community had witnessed firsthand the gradual destruction of salmon streams and wildlife habitat. However, over time, the Tlingit began to develop the skills necessary to challenge the accepted practices of resource development companies. They developed effective communication strategies, launched challenges in the courts, and educated people in the community about environmental regulation.

"I would like to say that we can work together," he said. "We will be needing help. All you have to do is write letters or be concerned, because we are a small band and we are very scared. We are fighting for our life. Last year was the toughest year we ever had, but we are getting super-educated, and we teach each other. We learn from people like you people here."

"First of all, I have to tell you where the Taku Valley is. The mouth of the river is 30 miles from Juneau, Alaska. On one side is the huge MacMillan glacier. The Taku Valley is about 100 miles long, and it is full of salmon, and sheep, goats, caribou, grizzly. From the highest level, it is probably about 200 feet ... it is only a short distance from sea level. When I was 16 years old—that's in 1957—I went to work for the highway maintenance, and the Taku River was used as a highway to bring out the ore from the mines in the Taku Valley by barge. At that time, I did not know anything about pollution or anything of that sort. To me, it was a wonderful thing the white man was doing, mining and getting gold and silver and everything out of the earth. I was at the mines— there were three mines going, the Takuchi, the Polaris, and the Big Bull Mine. There were 250 men working three shifts day and night. They never stopped the work; they worked the graveyard, night shift, and day shift. Everything was brought up by barge. The stuff that came off the mine when they washed the ore went right into a creek, called Canyon Creek. There are about 200 salmon streams in the Taku Valley—200 or more. The trough from the mine went right into the river. The mine started around 1935, and it quit in 1957. In 1988, the first salmon swam up that river, the first salmon and beaver. Over 30 years that river was dead; nothing lived in that river, and it is a big river, Canyon Creek...The mine just dumped the garbage off the bridge into the plains, and you have a huge garbage pile lying in the plains. I say the 'plains' because the glacier dammed up a lake, and twice a year the whole valley floods. The whole valley floods as high as you can see it, twenty feet of water, just the trees are sticking out. All that garbage gets washed away; at that time, I thought, they sure are smart and know how to get rid of their garbage. Later on, I thought about it, and all the tailings were put into the flood plain, right on the sand—tons and tons of tailings, and after a while it just disappeared. Now, the scientists have checked into it, and those tailings are still there, giving off acid... still polluting the river. It sunk 20 feet down underneath the sand but it is still there. The mine shut down in 1957 because it was too expensive to get out the ore from the mines and now Redfern Consolidated Mining and Smelting, and five or six or seven other mines want to put a road into the Taku Valley, and we said 'No' to Redfern and the others. The reason why we said, 'No', was because we knew the laws of environment, and we knew the laws of mining, and the laws of water pollution, and we knew the laws of timber cutting. Thirty years ago, when I was lucky to be a Chief, my top priority was in putting all our money into the education of our people. Our people came from the caveman stage

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where the highest grade was Grade 6, and you could see out the cracks of our houses; that's how poor we were. At times, I had to fight with my people when they needed new housing or some other stuff, and I was called names and everything, but I still put my top priority as education. Now, we have the most computerized band office in the North, and we know how to use it. We have to Grade 12, and two lawyers that are from our band. What I am telling you is that, if you know the laws of environment and all that, you can use it to your own benefit.

"I'll just put this is plain language. When we met with Redfern and they said, 'Well, you can't stop us', we were just like kids, Taku River Tlingit. We squealed, we tattle-taled; we tattle-taled to everybody we could see. We wrote to Environment and Natural Resources, Water Board, Forestry. We squealed to everybody, newspapers, and we kept a paper-trail. Our band has the highest paper that ever came out of any office. We write to MPs; we write to everybody that has even the slightest concern or connection with what we have to be working on. It is really working. We stopped Redfern. Our band is only 150 band members, but we stopped them and we stopped Interpak. They have to come and talk to us now. They said they were going to push us aside and put in a road and there is nothing we can do about it. In the Taku valley there are trees that are six or seven feet through, and the salmon are just packed into the river, and I told my people that throughout history we have fought against the Taltan, we have fought against the Haidas to protect our valley, and now this is our latest fight that we will have. I also told them that we, as elders, are only holding the fort. Wait until they come to their turn. They will have the most important tool that anybody ever had, and that is education. When any band member leaves a meeting like this, he is under orders to bring back and tell our band members what he has learned. We are small, but yet we can work fast. We have been to Oka; we intervened on Mares Island, Lyle Island, twin tracking, and the Sparrow case. A small community of 150 made a difference by intervening against the largest lumber company in the world, MacMillan Bloedel. We stopped them for seven years in Oregon by intervening in that court case."

—*Chief Ed Jack*

Ken Yuen, from the Department of Fisheries and Oceans, responded to several concerns raised in the panel discussion. He noted that the perceived lack of information on the human health effects of contaminants is attributable to the limited knowledge available at present.

"To put it simply, the reason we don't say a lot about the effect of these contaminants on the animals is because we don't know," he explained. "If we did, we would tell you, and that's exactly why we need the NCP to carry on in order to answer some of these questions."

Mr. Yuen said scientific findings related to contaminants are currently referred to Health Canada for assessment; it is the job of the Department to evaluate the data and make recommendations on consumption. Those results, in turn, are communicated back to northern communities.

"We don't take it upon ourselves to make pronouncements on what people should eat or should not eat, but these go back to communities and regional and local levels of government to make those decisions," he said. "To use an example, over the last several years, we have been measuring mercury and cadmium levels in ***muktuk*** from the Beaufort Sea. When we got those results, they were given back to the Inuvialuit Elders...they themselves decided what their people should do."

Richard Bargen, Chief Medical Officer of Health for the Baffin Region, suggested that Aboriginal people should be prepared to 'take control of the issue' by bringing together Elders with a knowledge of both health and cultural issues. Only then will it be possible to develop guidelines that are truly meaningful for northern communities.

Meeka Killabuk, a member of the Nunavut Implementation Commission, said that information on contaminants must be developed with respect for the knowledge systems and languages of Inuit and other Aboriginal peoples. Only by relating to the way of life of northern peoples can communications strategies be effective.

"Speaking from a very short time, in the sense of two years learning about the North, it seems to me that the problem of scientific information being fed into a culture that is in transition, and sort of being amplified through the media and so on, is one of the more significant human health effects of contaminants right now that should be dealt with. To make a very long story short, I believe that there must be some mechanism for Aboriginal people to simply take control of the issue whether it means forming a board of 'nutritional elders' or whatever, but it should be scientific people who have health knowledge and cultural knowledge. Perhaps the only person who should come on a board like this would be someone to whom you would give a rifle and a fishing line, and they would have to go out for three weeks. If they come back alive, they are on the board—that kind of thing. Living on the land—I have had some experience—has been most enlightening. The two times that I have seen an Inuk laugh heartily were when I was on the land with a gentleman called Pauloosie. We would just talk at night in the tent, through an interpreter, of course, and he said that he had heard that you could only eat a little cube of muktuk once a week. The only thing I could tell him was that if he ate more, it would annoy the government. But from a medical point-of-view right now, we couldn't say anything, and he thought that was very funny. He laughed for quite a while because it just seemed so ridiculous when you are on the land to have guidelines of this nature. Finally, he asked me if I thought he ate strangely, and I said, 'Well, I am a vegetarian.' Through the interpreter he asked what a vegetarian was. I said, it was someone who does not eat meat. He said, 'Eh, you don't eat any meat?', and I said, 'No', and he was quiet for a while. Then he started laughing, and laughed for about a minute. I understand this completely. It was so great. The relationship between food and life on the land is clear even to a vegetarian up here, and I think it is really important that you take charge of this issue, take control, get your experts together, and do it. Otherwise this will go on until things settle down, but it will probably be 20 years."

—Richard Bargen

"I don't like the word 'harvest'," she said. "That, to me, is picking up vegetables at one season. We don't 'harvest' animals. We don't touch caribou" and say, 'Is that ready to be harvested?' So, the use of language is very important. We have a sort of understanding...but our language is very precise, and I would recommend that some of our terminology be adopted and used."

Panel Discussion
"Northern Foods: Standards, Monitoring, and Consuming in Confidence"

Chair: **Jack MacKinnon,** ***GNWT Department of Health***
Panelists: **Harriet Kuhnlein,** ***Centre for Nutrition and the Environment of Indigenous Peoples***
Martha Flaherty, ***Pauktuutit***
Michel Fournier, ***Université du Québec à Montréal***

Jack MacKinnon, representing the Government of the Northwest Territories Department of Health, noted the difficulty in trying to assess the "safety" of country foods. Noting that the Government of the Northwest Territories has announced plans for a national forum on the issue, he stressed the importance of achieving consensus "so that we are not giving mixed messages to different people in different regions of the country".

He referred to several of the questions raised at the Commission's regional fora:

- Is it possible, or desirable, to apply more stringent standards to country foods? If so, how could such programs be implemented effectively?
- What is the role of community-level organizations, such as hunters and trappers associations, in monitoring?
- Are facilities for the analysis of country food adequate to serve the needs of Canada's northern regions?
- What are the practical limitations of existing programs?
- Can initiatives from other arctic countries be applied in whole or in part to the Canadian situation?

Harriet Kuhnlein, Director of the Centre for Nutrition and the Environment of Indigenous Peoples (CINE), agreed that the issue is complex—as is the science applied in the search for solutions.

"There are toxicologists who estimate risk from consuming food that has a particular contaminant," she said. "There are nutritionists, such as myself, who estimate risk from not consuming the particular food or diet that has enough good nutrition, and in the North we now know that this means not enough rich traditional food. There are other scientists as well who estimate cultural meanings and economic benefits of traditional food. So, we are now in this arena of estimating benefits as well as risks, and trying to balance them one against the other."

Dr. Kuhnlein underscored the risk/benefit dilemma faced by northern residents and by public authorities charged with setting guidelines for consumption. Foods that are nutritionally rich, readily available, and central to traditional ways of life cannot easily be replaced in the northern diet; at the same time, communities must be made aware of the potential health risks associated with particular species or consumption patterns.

"At this point in time, it is the perspective of many people that the people consuming these foods are losing confidence," she observed. "And they are losing confidence in standards for many of the contaminants in arctic wildlife, because standards are set when too little information is known. But, we have to set standards; it is the role of the government to do so."

Dr. Kuhnlein said the fact that too little is known about contaminants has forced toxicologists to set "a very conservative, stringent standard" for northern country foods; however, the regulatory model has provoked a degree of anger in some northern communities, particularly in those instances where the risk to human health has not been thoroughly documented. She noted, as well, that scientists lack the techniques necessary to deal with the wide range of chemicals present in certain foods.

"We have PCBs, toxaphene, chlordane, mercury...So, at this point in time, it is not possible to set a single standard on how much of one food to eat to be safe for all those contaminants at one time, except to say: 'Take it out—don't eat any at all.' Furthermore, people eat many different kinds of traditional food, all of which have different contaminant risks, different nutritional properties, cultural meanings, and economic benefits. The mathematics of all this become mind-boggling, as you can appreciate."

While the conventional wisdom has been to strike a balance between contaminant risk and nutritional benefit, Dr. Kuhnlein suggested that this approach may have certain drawbacks when it comes to marshalling political will at the national and international levels.

"How can you press for international action against those rich and powerful industries if the people involved are not sick or dead from these contaminants?" she asked. "Nutrition and the fact that you care about the food you eat are not very compelling political arguments against this enemy."

Martha Flaherty, President of Pauktuutit, the National Inuit Women's Association, addressed three broad themes related to contaminants: ethical issues in research; the need for full and equal participation by Inuit women in all aspects of society; and access to information as a key component

of empowerment. She noted that Pauktuutit has taken a strong stand on ethical issues, saying the time has come for Inuit to "define a new relationship with non-Inuit scientists, researchers, and academics".

"As the president of an organization dedicated to improving the social, economic, political and health conditions of Inuit women, I can only endorse research that is community-based and community-directed, and that leads to positive change," she said. "Research priorities must be determined by Inuit for change to be accepted and to be effective. Inuit must have ownership of the process and results. We must have access to all the information we require to make informed choices about our health for ourselves and for our children. It is also important for researchers to share their skills and knowledge with people in the communities while doing their research. Researchers who work with Inuit have a responsibility to transfer skills and knowledge by involving Inuit in their work from the design of the methodology to analysis and final reporting, so that we can conduct our own research for a better change."

As part of its annual general meeting in 1996, Pauktuutit held a two-day workshop on environmental contaminants. The occasion presented Inuit women with an opportunity to discuss the contaminants issue, in particular the physiological and cultural differences between the sexes. Recent studies have revealed elevated levels of PCBs in maternal and cord-blood samples from Inuit women; the findings are cause for concern, as the greatest risk to human health from PCBs is during the time of fetal development. To help minimize the risk, Inuit women require up-to-date information on the levels of contaminants in traditional foods such as marine mammals, caribou, and char.

"Inuit women have many concerns about contamination of the arctic food-chain, and we are aware that there are substances in our environment that affect the traditional foods we eat. We have received some information about contaminants in our traditional foods, but we are not necessarily sure that we have all the information we need to weigh the risks and benefits of traditional foods.

"Incomplete messages can be confusing because of seeming contradictions. Some messages can seem to be contradictory, such as advising nursing mothers to continue to breast-feed their babies, while telling them at the same time that PCBs can be harmful to their baby's health, their children's health. With complete messages that we convey to people in the communities in a respectful and sensitive manner, we can take control of the information that we need to protect ourselves and our children from the harmful effects of environmental contaminants to the greatest extent possible. It can also be confusing when different organizations or groups of people are doing what seems to be similar work with an integrated and co-ordinated method of sharing the results of their studies with us. It would be helpful to have one designated organization that is known and trusted by Inuit to disseminate information about environmental and other health issues. People would also know where they could go for additional information, or it could act as a clearing-house."

—Martha Flaherty

"Knowledge and information are power," she told participants. "By having a better understanding about environmental contaminants and how they affect our sources of traditional foods, we can take ownership of the solutions we need to protect our health and be empowered to make positive choices or changes for ourselves, our children, and their future."

Michel Fournier, director of TOXEN at the Université du Québec à Montréal, recalled how he had been prompted to begin a research program on beluga whales in 1989 after learning of the high prevalence of cancer, viral and bacterial infections, and chemical contamination in samples taken from the St. Lawrence River; in some cases, animals contained anywhere from 20 to 50 times the amount of PCBs and other chemicals found in beluga in the Arctic. Despite clear evidence of health problems associated with the consumption of contaminated blubber, there remain those who reject a link between chemical contaminants and health problems.

> *"When I was a very young boy, my father was a hunter and fisherman in the eastern part of Quebec. It was usual to go trout fishing on Lake Awashish in the Gaspésie area. At that time, those trout were probably contaminated. This summer, I went there with my daughter to fish for trout in the same lake. There are no more trout. Don't let that happen here."*
>
> *—Michel Fournier*

"There is heavy contamination in them, there is a high prevalence of cancer, but there are still scientists who believe that the health problems found in St. Lawrence beluga are not linked to exposure to chemicals," he said. "You will find such scientists certainly in industry, but also in several governmental levels of decision-making. So, I believe that you will have a very hard time to convince the same scientists that there is a real problem in the Arctic."

Panel Discussion
"Communicating with Communities"

Chair: **Charlie Furlong, *Métis Nation of the Northwest Territories***
Panelists: **Craig Boljkovak, *Inuit Tapirisat of Canada***
Bruce Rigby, *Nunavut Research Institute*
Roy Koerner, *Geological Survey of Canada*

Charlie Furlong of the Métis Nation of the Northwest Territories, spoke of the importance of good communications in relaying the concerns of northern communities to outside organizations, particularly those responsible for scientific research and health protection.

"We want to know what is going on with the research that is happening," he said. "We want to know what impact it is going to have...You know, in my own area, it is a great concern. There has

been a high rate of cancer. People want to know why. When the CPC was in Aklavik in June, the subject came up. The CPC listened to our recommendations, wrote a letter, and found out that the last study done on cancer research in my area was 15 years ago. And that research was really not the answer that people wanted."

"In my work, I travel a lot between communities. I meet with a lot of people, a lot of grass-roots people—my kind of people. I know how they act, I know how they talk, how they talk about researchers, and how they talk about their native organizations, the press, the CBC, and things like that. Communities want first-hand information. They want to know what is going on. They want to hear it from the horse's mouth. They don't want it to be interpreted by three or four groups before it finally gets to them. Twenty years ago, communities had a high dependency on consultants and their own organizations to carry out their message. Twenty years is a long time. A lot of our people are educated, know what is going on, are involved in community politics. The days of having the Hudson's Bay manager or the Anglican minister or the RC minister being your community leader on your community council is over now. Our native people are there. They are taking more control. The government of the Territories is supporting an initiative of more community control. It is there. People want to control the issues that affect their everyday life. I strongly believe that the government has to develop partnerships with communities. Whenever there is a project to be taken on, I think a partnership has to be in place, because it is the communities now that are taking more control of the regional or territorial organization. They tell them what to do. Most times, our own organizations interpret our message in the wrong way. Again, that causes some confusion. It is a long learning process, but I think the bottom line here is that when that dollar comes out of the federal government's hand it should go to the communities; they are the ones that should decide where and how that dollar should be spent."

—Charlie Furlong

Craig Boljkovak, of the Inuit Tapirisat of Canada (ITC), said his organization has worked hard to develop an ongoing rapport with Inuit communities on a number of key issues, including the environment and contaminants. He stressed the need for information to be delivered by individuals who are both fluent in local dialects and trusted in the communities. As well, the "pre-testing" of materials can help determine those communications approaches most likely to succeed; in the case of ITC, regional project officers have been instrumental in helping refine techniques in close consultation with the communities themselves. Another important consideration is the development of an effective strategy for the distribution of information.

"All too often, you get pamphlets or videos of something the government has given an organization money to pull together, and it sits on a shelf," said Mr. Boljkovak. "It goes to the wrong organization within a community, and it sits there gathering dust, unused, and irrelevant to the people in those communities."

Bruce Rigby, Executive Director of the Nunavut Research Institute, said communications is largely a matter of scale: the strategy applied in a community setting will differ significantly from that applied on a regional, national, or circumpolar basis. For the most part, however, communications involves taking a "common sense" approach to people's information requirements.

> *"We hear loud and clear from the people that we serve that people want to be involved much earlier in discussions and research involving contaminants work and research in general. The presentation of the information in the communities is more credible if it can be presented using local examples, using local information, through people that the community can trust. We have a sort of migrating species here in the summertime, called the 'science community'. They come up, they do research, and they leave. Many of them do very good work, but what we are trying to encourage that group to do is to ensure that people understand what they are doing, that they have involved the community in the planning and development of that research. There is no magic bullet. Really good communication takes time and trust, particularly in a day and age where we are being bombarded with so much information. In the North, like everywhere else in Canada, and in the world, we have 65 cable channels. We can have access to baseball games from Los Angeles or wherever. So, when you have information that is entering the system, it has to be done in such a way that people can identify with and draw in, and not within the context of the large amount that is being presented to them."*
>
> —*Bruce Rigby*

"Northern residents are really no different from anyone else anywhere in the world," he pointed out. "They to have good quality information on what is happening to them and around them. For many years, particularly on information on contaminants and about contaminants research, it was thought to be over the heads of people in the communities, of little interest to people in the communities—a whole series of different ideas. The result was that people just merely went along on their way and did their studies and really didn't involve the communities in part of what was going on. I think nothing could be further from the truth. I think that while many issues may be complex and may require approaches to explain technical information, it behoves the scientific community, government agencies, and the media, to develop ways in which information can be presented to the people that we serve in a form that they can understand and appreciate."

Mr. Rigby said communication involves three elements: the individual or organization transmitting the information, the message itself; and the individual or group receiving the information. In cases where communications is seen to have failed, it is often because one or more of these elements has not worked effectively.

"Either the message is too complicated for the people that they are serving, the receiver is not there or is misidentified, or the transmitter is not appropriately transmitting the information," he suggested. "I think that is a very important aspect to keep in mind in developing messages."

Mr. Rigby spoke, as well, of the three general areas of communication relating to science in the North:

- communication related to the development of the research process;
- communication of research results; and
- communication of general information, designed to raise public awareness of research issues.

He observed that communication in the North is very different from the situation in the South. Television and radio are truly "interactive" media, through open-line shows and panel presentations. Posters and displays in public areas such as the local nursing centre or adult education facility, are also effective. Schools serve as a vital link between younger northerners, community elders, and the science community.

Roy Koerner, of the Geological Survey of Canada, said the communication of research findings presents a problem for the science community, not only in terms of popularizing complex concepts and ideas, but in terms of priorities and funding. One approach is to involve local residents directly in field work—a strategy that encourages two-way communication and can often lead to better science. Dr. Koerner cited the example of climate studies being conducted on the snow layer near Pangnirtung; although researchers were unable to agree among themselves on temperature findings for a particular summer, local residents were able to pinpoint the year by recalling that thunderstorms—a rare event in the area—had frightened some people in the communities.

> *"It was quite clear to me here that what the native people really want to know, is 'Is it bad eating this food?', and, 'How bad is it?' And I also would like to know what the toxicity levels are. For example, I gave a talk on radionucleides. We measure this in the snow. We can see the big bomb layers from 1963. They are still there, big spikes in radionucleides, plutonium and this kind of thing. We have someone working for us who can record every single bomb layer from the Russians, Chinese, and so on; they are all there in the snow. But then when I am going to present this, I know someone in the audience is going to say, 'Well, this level, does it really matter?' And that is a legitimate question. I don't know how to answer, so I telephoned the person who has done this work. He doesn't know either, and nobody seems to know. Now, there probably are these numbers somewhere; I wish someone would get all this stuff together. I mean, I am not the person eating the food. I don't study the animals. I don't study the people. I study the elements themselves, but I think it would be nice if someone asked me that question and I could tell them."*
>
> —Roy Koerner

Panel Discussion
"The Public and Private Sectors in Environmental Protection"

Chair: **Jon Grant, *Canadian Polar Commission***
Panelists: **Joe Kunuk, *Mayor of Iqaluit***
Pierre Béland, *St. Lawrence National Institute of Ecotoxicology*
André MacNeil, *Qiqittaluk Corporation*

Jon Grant, a member of the Canadian Polar Commission, said the conference should strive to deliver a strong message on the need for a polar research capability focused on key issues such as contaminants. He noted that it is the job of the Commission to push for such action and help ensure that the environmental problems of today are not left unresolved a decade or more from now.

> *"Back in 1987, I was asked to speak at the Conference Board on business and the environment, for a particular reason, because I happened to have just finished canoe-tripping in Temagami, Ontario. I decided to go off my text and talk about clear-cutting in Temagami on Shield country which was not sustainable. Well, it hit the front pages of the Globe and Mail the next morning. I was literally drummed out of the Business Council on National Issues and a number of other associations...But, I learned from this, that you have always got to lead, and you have always got to push, or you don't accomplish objectives in terms of trying to convince, for instance, the private sector to make changes. The more research we do, the more money that goes into research now to build the critical base of information, and to identify focused and very credible speakers who can take that information and talk to it, very clearly will move the agenda along in the private sector. This is the only way, in many cases, that the job gets accomplished. So, this is a short way of saying that I think the loaf is half-baked—it needs much more work, it needs much more caring, and it needs the very strong, credible spokespeople who can take this story not only nationally but internationally and bring it to the attention of Canadians and other people in the circumpolar North. It will eventually get to the corporations if changes are required, and changes are required. Time is running out. If we don't accomplish the objectives in the Arctic, if we don't solve the problem here, I guess I would suggest that anything we've tried to do up to now in the temperate climates is doomed to failure. It is our last chance."*
>
> —*Jon Grant*

Joe Kunuk, Mayor of Iqaluit, thanked the Commission for its decision to host the conference in Nunavut, noting that northern communities are afforded few opportunities for such input. Following up the remarks made by the Panel Chair, Mr. Kunuk suggested that Canadians can only make a convincing argument against contaminants at the international level if they themselves are willing to confront the reality of "self-induced" contaminants such as alcohol, cigarettes, and drugs.

"Some of us have gone through the pain of these different contaminants throughout our life," he said. "It goes to show that if I don't take care of myself and continue to have 'self-induced' contaminants put in my body, why should I worry about DDT or PCBs?...So the physical, emotional, spiritual health of our people has to be addressed in conjunction with this type of workshop that the CPC has sponsored."

Mr. Kunuk described recent efforts to clean up Iqaluit's Upper Base, a military installation established just north of the community by the U.S. Air Force in the early 1950s. Like a number of similar sites scattered throughout the North, the base was found to be contaminated with PCBs from a variety of sources. A clean-up program, spearheaded by the municipal council in conjunction with the regional Inuit Association and the Tunngavik Federation of Nunavut, provided more than 50 local people—90 per cent of them Inuit—with training in toxic waste handling and disposal. All told, more than $2 million was spent to clean up the site, and local businesses benefited greatly from the project.

"This is one success story that we can use to share with the scientific world, with the governments of Canada and the provinces, the territorial government, and the CPC," said Mr. Kunuk. At the same time, he expressed dissatisfaction with the manner in which funding for such projects is being curtailed.

"In my involvement at the local, territorial, and international levels, I continue to get frustrated that the funding is being cut," he said. "The AES program will be cut next March, but the problems will continue to haunt us and our children."

Pierre Béland, of the St. Lawrence National Institute of Ecotoxicology, said it has taken several decades for policy makers to realize that environmental management involves much more than the creation of new national parks and protected areas.

"It was a long time before we changed out attitude as a society toward environmental protection," he noted. "We were still talking about national parks until the late 1980s, trying to protect specific areas, not thinking what was the use of selecting an area for a national park when acid rain was falling over that park and killing the trees and the lakes. What was the use in selecting a national park like the one for the belugas in the St. Lawrence? What is the use of it if the chemicals are coming down the river? Obviously, this attitude was wrong even then, 40 years ago, but we believed it was correct because we had not recognized what was happening."

Dr. Béland noted that the Polar Commission's regional meetings had produced a recommendation to the conference calling for government research capabilities to be maintained. He suggested that the issue is an important one given the current climate in which public-sector agencies throughout the world have experienced significant cuts to research programs, monitoring capabilities, and regulatory enforcement.

"Without monitoring and regulatory enforcement, we are not going anywhere," he maintained. "We are going back in time, and I am not sure that is a good idea. It would be good if we could get rid of the chemicals and go back in time to 1930 and say, with hindsight, 'We are not going to use those chemicals'. But it is too late for that now."

> *"If you listen to our politicians in general, you get the impression that the sole purpose of man evolving on this planet for two million years is so that we will become competitive in world markets. To me, that does not make much sense, but that's what our governments are telling us that we have to think in terms of globalization of the world markets. When I went a couple of years ago to a meeting of the House of Commons Committee on the Environment, they were looking at renewing the Canadian Environmental Protection Act. I asked them, 'What are you doing internationally?' They asked what I meant. I asked if they would have regulations for trade with other countries. They said no, because they were only thinking in terms of the Canadian Environmental Protection Act. I said, yes, but those chemicals are coming to us from China, from India, from Mexico. We are trading with these people and we are not putting any restrictions on what activities they can have in their countries, and we are buying the stuff from their countries, so what is the point in looking only at our own back yard if people are polluting elsewhere? I think that applies very well to the Arctic: What is the point in cleaning up the dump behind the hill there if all the other chemicals are coming through the air? I think these are some of the things our governments are not really thinking about, but they should."*
>
> —*Pierre Béland*

With respect to the private sector, Dr. Béland warned that the business community has recently narrowed its focus to economic issues—market globalization, in particular—largely at the expense of earlier efforts to promote sustainable development and environmental responsibility. At the same time, the environmental activism traditionally associated with non-governmental agencies has declined due to reduced funding and a lack of long-term research. The end result is that issues such as contaminants are no longer considered a priority for private- or public-sector investment.

"I think we have to have a transition from this type of thinking to the new vision that I have, and that many people have—that we need to consider quality of life; we need to consider our environment," he said. "We need to consider what we want to be as human beings in the future, other than being competitive on the world markets.

"I have three messages for each of these groups: governments, the general public, and industry. I think governments have to be firm, have to maintain their capability for acting on the process of cleaning up our environment and changing our way of looking at things—they have to be firm and innovative. The public has to be as active as before; they have to be empowered. They have to think in terms of the power they have as consumers and as voters. Industry has to be responsible as citizens; they have to think more in terms of the local jurisdiction, in terms of the local community...The emphasis on community has to be there, building partnerships with communities.

Companies should be part of communities. Instead of thinking in terms of a multinational corporation that has no allegiance to anybody, they should think in terms of people in communities and cities, in provinces or states, where they live and where their children will live."

André MacNeil, of Qiqittaaluk Corporation, described his firm's involvement in the clean-up of hazardous and non-hazardous waste materials at Cape Hooper, a Distant Early Warning (DEW) Line site. Continually manned until the 1990s, the installation now serves as a short-range radar site, requiring only occasional maintenance.

The Cape Hooper project includes the collection of debris, the demolition of unnecessary buildings, the removal of oil tanks, and the clean-up and burying of non-hazardous materials on the site. Hazardous materials, including contaminated soil, will be gathered, sorted, packaged, and transported off-site for disposal. The prime contractor for the project is Nunasi Corporation, an Inuit-owned company. Work began in June 1996 and is scheduled to continue until the fall of 1997.

Mr. MacNeil described how extensive testing of soil, plants, fresh water, and marine species was required to determine the scope of the project and set benchmarks for the work. But while the technical challenges are considerable, there are also important socio-economic factors to be taken into account—the concerns of local residents, the maximization of economic benefits for the region, and provision of training and employment opportunities. With respect to the latter, Qiqittaaluk and Nunasi worked with Nunavut Tunngavik Inc. to train 50 local residents in the handling of dangerous goods; eventually, such training will lead to the development of a pool of skilled workers able to tackle similiar projects at other DEW Line sites in the Arctic.

"It has been apparent to me when I have met with those on site and from reports from supervisors that the Inuit employed have a vested interest in making Cape Hooper as clean as possible," he noted. "I know that a lot of the people who are working there hunt and fish in the area... People really consider it to be their land, and when they are cleaning up they are cleaning up their land—they are not just on a construction site somewhere."

Comment

Comments from the floor reflected concern over the self-regulatory capability of industry and the need to ensure that environmental research and monitoring continue to be supported.

Bob Van Dijken, of Whitehorse, Yukon, suggested that standards certification represents a potential problem for environmental management.

"In an era of government downsizing, a real scary word for me is 'regulatory efficiency'," he said. "We are hearing of initiatives like ISO 14000, which I guess is the International Standards Organization. From my understanding, this would allow industries or individual companies to get

themselves certified and then do self-regulation, self-monitoring. I think we are trying to fight here to get more knowledge and ensure that the ball keeps on rolling, but initiatives like ISO 14000 seem to be heading in the other direction."

Pierre Béland concurred with the view that industry self-regulation may be less than desirable.

"I think there is a danger there," he said. "One of the dangers is the tendency—and we have seen that in the Great Lakes—for jurisdictions to try and reach the lowest common denominator; for example one state or one province says 'That fish shouldn't have more than one part per million', and another one says, 'It shouldn't have more than two'. The tendency is to adopt the lowest common denominator...but it should be the opposite. It should be the strictest one that should become the common one, but it is not easy to achieve."

Jon Grant said Dr. Béland's observation was a valid one, as a major concern is to ensure that cutbacks do not jeopardize important gains already made. Using the example of industry associations, he noted:

"You deal with the lowest common denominator because you must please the least performing member of that association. I have always had the view that what you try and do in industry is find the best-performing organization and then encourage them to be a champion, which then pulls the whole sector up. That can be quite effective....The tougher challenge is to force issues, and that is when you run into all kinds of devastating road-blocks. But nothing ever gets changed unless it happens that way."

Dr. Béland commented that governments may be able to "scale down" their research capabilities so long as appropriate funding is transferred to independent, private research organizations.

"I think we would be better off because we would have an objective measurement, an objective type of research, and we would also save money because governments are known not to be as efficient as private corporations," he said.

Ted Lambert, from Yukon College, said the question of who "owns" the environmental problems of the North is one that must be considered alongside regulation, monitoring, and funding.

"Why are northerners, why are Canadians, being asked to clean up the mess of the bloody governments from the South and of the military?" he asked. "We are left with a legacy of point-source pollution in the Yukon Territory that is absolutely devastating. When are the politicians and policy-makers going to face up to their neighbours to the South and say, 'Look, why don't you stop your shooting ranges for one day and give us the cash from that? That will provide 20 years of AES, thank you very much.' When are we going to get off our butts and start talking to the people that are really the cause of the problem in the first place?"

Panel Discussion
"Managing Northern Contaminants: Government/Citizen Initiatives"

Chair: **Michael Kusugak,** ***Canadian Polar Commission***
Panelists: **Leslie Whitby,** ***Department of Indian Affairs and Northern Development***
David Malcolm, ***Aurora Research Institute***
Barney Masuzumi, ***K'asho Got'ine Community Council***
Frank Anderson, ***Labrador Inuit Association***

Leslie Whitby of the Department of Indian Affairs and Northern Development outlined the federal government's Northern Contaminants Program (NCP), noting that it is both a program for scientific research and a means of communicating information on contaminants to northern communities. A strong emphasis on partnerships and broad participation has enabled the NCP to move the contaminants agenda forward and to identify the kinds of actions required to effect change in the global environment. A key step was to review the convention on long-range transport of air pollution as a mechanism for banning the manufacture and discharge of toxic chemicals.

David Malcolm, of the Aurora Research Institute (ARI), explained the role of the Institute in contaminants research and regional communications. The agency assists southern researchers with logistical and technical support through its research facilities at Inuvik and Fort Smith, and is also responsible for research licensing in the western Arctic. In addition, ARI provides education and training in environmental management, helping develop technical expertise in western Arctic communities. Education also involves the publication of plain-language reports on contaminants and related topics, as well as efforts to raise awareness of science and technology issues through school curricula.

"This is something that we want to continue and emphasize, and, after attending this conference, I can certainly see the importance of getting even a simple understanding of the importance of contaminants in people's lives, getting that before students not only in terms of it being an example of science and technology, but to eventually have it worked into curriculum."

Mr. Malcolm said the development of a northern research agenda is an important step forward for both ARI and its counterpart in Nunavut. Based on surveys and consultations with community agencies, band councils, tribal councils, development corporations, businesses, cultural groups, the report identifies priorities and methods of research most appropriate to northern communities.

"The difficulty, of course, is that...you can't set a list of 10 or 15 or 20 priorities and say, 'This is going to apply to all communities in the western Arctic'. It just doesn't work that way, because every community is unique, has its own problems, its own ideas, its own base of experience, and

"When, in 1993, we as Canada took on the chair of something called the Arctic Environmental Protection Strategy, which was the eight circumpolar countries and three indigenous organizations, we asked for their support in going forward to seek some sort of international action between the developed and the developing countries. This became known as the 'Canada problem' for a while, because Canada was the only country doing research on it. The Americans' research budget was very low, and the results had not yet started to come in from Greenland and many of the other countries. So, we didn't want to pigeon-hole it, so that people would just say, 'Oh yes, that is a Canadian problem over there.' We wanted to build a broader constituency for action. The partnership we struck was with the government of the Philippines because we discovered, quite by accident, that they had had a great deal of difficulty banning some of these chemicals. They wanted to ban them because they were concerned about people's health and safety, and they were also seriously wondering whether these pesticides did any use in the first place. So, with the Philippines over the last two years we have had a number of meetings, and we have involved industry in it this time because if we didn't get the industries to start looking at developing alternative sources for these very persistent chemicals we didn't think that we were going to get very far in persuading groups like the World Health Organization to stop spraying DDT for malaria control.

"We got agreement by virtually everybody that we did have a case for changing the way we managed these chemicals. Some would probably still have to be applied in certain circumstances, but between us all we could probably go forward. That is being presented this coming year to the United Nations environment program. We are working now to seek the support of all the other countries who are part of the United Nations Environment Programme for moving to a globally binding agreement to stop the major use and discharge of these chemicals. There is a lot more to be done. There are a lot of other opportunities. There are a lot of other fora. What often happens is when people go to these, they see an opportunity and they look at ways that they can be presented. I am sure that through the Arctic Council and Mary Simon's work there will be more ability for the circumpolar countries to influence these agendas."

—Leslie Whitby

its own priorities. So, we have to develop a research agenda which is flexible enough to adapt to the requirements of communities."

Finally, Mr. Malcolm addressed the issue of research licensing as it relates to government/citizen initiatives, noting that the process must be understood and adhered to by all stakeholders; otherwise, what should function as an aid to research may be perceived as an obstacle. Governments and Aboriginal organizations tend toward a loose interpretation of their obligations under the N.W.T. Scientists Act, and southern universities frequently set unrealistic timelines for community-level research.

"Many researchers from the South do not comprehend the additional time required to process licensing applications and then carry out the research in the face of the community approval process," he said. "It is not unusual for us to receive a call from a researcher in the South telling us that his graduate student will be arriving in two weeks and he just remembered he needs a licence. That is, unfortunately, a common occurrence, and we have to very politely tell that researcher that he must go through the various requirements and must discuss with the communities concerned whether or not the research is appropriate, how it going to be carried out, and so on."

Barney Masuzumi of the K'asho Got'ine Community Council in Fort Good Hope, began his presentation by noting the importance of partnerships between the research community and northerners in an era of rapid change. He noted, in particular, the work of the Polar Commission and the Arctic Environmental Strategy.

"It is encouraging to see this," he commented. "We see this partnership at various levels."

Mr. Masuzumi said the conference had helped highlight the importance of common ground in approaches to contaminants and other issues of concern to northerners. While it is essential to reach a degree of consensus on concepts and terminology, there is also a pressing need for cross-cultural awareness.

"The institutions currently involved in trying to forge new relationships with community entities—they themselves have been agents of change," he pointed out. "We have lots of areas that we thought we would like to investigate, setting the research agenda. There are internal things; we want to account for the impacts that have occurred to us as a collective. And there are things beyond our vision, beyond our line of sight—the activities of offices in Ottawa and different programs with international considerations."

Mr. Masuzumi spoke as well about the changes to the regulatory framework for northern development and the need for compliance on the part of all parties. However, he reminded participants that change can be a positive factor in addressing issues of concerns to northern communities.

"We challenge ourselves when we challenge the conventional assumptions that are currently in place," he said. "Most of all, we challenge the assumptions that brought, of course, many of the issues to the table. We challenge the assumptions of language and terminology and, in the end, hope that this challenge will result in the dialogue we are seeking."

Frank Anderson of the Labrador Inuit Association took issue with the concept of "managing" contaminants, saying the ability of individuals or organizations to deal effectively with such issues depends on a number of factors.

"To manage something implies that you have control over it, and it has been iterated several times already that a lot of the pollution that we are talking about we have no real control over," he said. "To effectively deal with northern contaminants, I think, requires both government and community initiatives. Let's start with government. I believe that the obvious course of action is continued lobbying at the national and international levels to reduce the production and usage of industrial pesticides, those contaminants that we don't have any control over. There is very little at the community level, other than the communication of the effects of these contaminants, that we can really do."

Mr. Anderson expressed concern with the current approach to arctic contaminants on the part of the federal government, in particular the exclusion of the provincial North from research programs. He noted that while international programs adopt a view of the Arctic not defined by territorial borders, Canadian policies and programs are often constrained by the 60th parallel. With respect to citizen initiatives, Mr. Anderson described a program for waste management in the community of Nain, in northern Labrador. Conceived as a joint project by the community of Nain, the Labrador Inuit Health Commission, and the Labrador Inuit Association, the program received funding from Health Canada to: identify ways in which the clean up and recycling of hazardous wastes could be made more effective in Arctic communities; raise public awareness of the need for waste reduction; and evaluate the adequacy of existing water and sewage services in the community.

"Let me take a little time here to point out something that I personally had a bit of difficulty with when I worked for the ICC. It deals with the way Canada and the federal government deals with some of these contaminants, or I should say 'tries' to deal with these problems. At the international level, at the Arctic Environmental Protection Strategy meetings, I look at the maps that are produced by the monitoring and assessment working groups, and by the conservation working groups, and they show their internationally accepted definition of the Arctic: it goes right from the Yukon, comes right down almost into James Bay, takes in northern Quebec and right down the Labrador coast. But, if you were to go to a national meeting of the Arctic Environmental Strategy, you see or hear no mention of Nunavik or of Labrador. I think there is something wrong there. Any future renewed or brand-new arctic strategy that is going to deal with contaminants has to include Nunavik and Labrador as well, if only for the sake of getting an exact, clear picture of what contaminants are present from my home in Labrador to Norma's in Old Crow. I think the success of the last few years of the AES has got everybody agreeing that any new or renewed strategy cannot and will not work without the true, complete participation of the Aboriginal peoples of the Arctic, right from the planning to the application stages of whatever strategy may be forthcoming."

—Frank Anderson

"I guess you could say that it comes down to co-operation at the community and regional level, and co-operation with governments—provincial, territorial, federal, whatever they may be," he suggested. "Quite often we need the financial support from government to do some of the activities

that are required in our communities, but the government also needs our input to determine what research should be done and where. This, I think, will differ from region to region. For example, our priorities may not be the same as those in Nunavik or the Kitikmeot regions, but I guess the bottom line is still the same. Those unseen contaminants in our ecosystem that we did not put there have to be eliminated, or at least not allowed to accumulate any further. But it is up to us as individuals and as communities to reduce those contaminants we do have some control over."

Presentation by Jack Anawak, M.P., Nunatsiaq (on behalf of Minister of Indian Affairs and Northern Development the Hon. Ron Irwin)

"Thank you for your kind introduction, and thank you, ladies and gentlemen, for this opportunity to join you this evening. Minister Irwin regrets that he cannot be here tonight, but he has sent these remarks, which I am pleased to deliver on his behalf.

"The Canadian Polar Commission has provided us with this unique opportunity to look at problems relating to contaminants in the North. We can also acknowledge the fine work that has been done by scientists and the northern communities working co-operatively. And, it's an occasion where we can rededicate ourselves to the challenge of finding solutions to the problems of Arctic contaminants.

"The contamination of the Canadian Arctic is indeed a complex problem. It has both local and global dimensions, and it requires action both in Canada and by international bodies like the United Nations.

"Since 1991, the Arctic Environmental Strategy, through the Northern Contaminants Program, has helped government and Northerners work together on this issue. I believe that anyone who has worked with the Program will agree that it has achieved much in a short time.

"The Program has made progress because the parties worked together in partnership. The federal government believes in building partnerships. This is one area where we are particularly proud of the success. All levels of government participate, including five Aboriginal organizations that serve as full members of the Science Managers and Technical Committees on Arctic Contaminants. They are: the Inuit Circumpolar Conference; the Inuit Tapirisat of Canada; the Council for Yukon First Nations; the Dene Nation; and the Métis Nation.

"But perhaps even more important to the success of the partnership has been the direct contribution of people and communities from across the North.

"The Program has tried to involve everyone, and this helped to ensure that decisions had input from a broad range of perspectives and information from many different sources.

"Northerners helped conduct on-site surveys. They received training in the survey methods. They collected wildlife samples for analysis, so that the information scientists have analysed has relied on local expertise.

"When you get partnerships working to involve communities and the umbrella organizations of the Aboriginal peoples, you are trying to make sure that the program addresses the real concerns of the people. For a program to gather scientific data, this means that you must focus not just on scientific inquiry, but on community concerns as well.

"Northern scientists are pursuing knowledge that will make a difference to people's lives. This knowledge-based economy is driven by science and affects each of us in our daily lives.

"The people who have been working on the Northern Contaminants Program know how this scientific study is going to help them. It's going to help present a case on the international stage for cleaning up the Arctic environment, and keeping the pollutants away.

"From this partnership, I think that government officials have learned to appreciate the depth and breadth of expertise to be found in the communities. At the same time, Northerners have a better understanding about how government operates.

"By taking the time to work and make decisions together, you have succeeded in establishing a climate of trust and mutual respect. This has shown real partnership in action.

"By building these kinds of partnerships, you are going to create a continuing legacy of people concerned about the environment working together on the contaminant issue in the North.

"So building the partnerships has been very important. But what about the actual research of the Northern Contaminants Program? Since 1991, the federal government has spent about $25 million on over 100 research projects. Are we any further ahead in what we know? We are, but we still have much to do.

"For example, we need to figure out what we are going to do to reduce the level of contaminants in the Arctic.

"The first step is one that's already been taken: we've regulated PCBs, DDT, and other toxins that, when released to the environment, get carried up to the North and affect the people who have had nothing to do with the creation of the problem in the first place. We must get our own house in order, and that's what we are doing.

"The next step is to put pressure on the international community so that other countries will understand the consequences of their actions and stop polluting. Ambassador John and Ambassador Mary have been working to present Canada's case on the international stage.

"But there are two realities we must recognize when we deal with the international community. The first is that we have to work step-by-step to make incremental progress.

"For example, it would be hard to convince the World Health Organization to promote a worldwide ban on DDT—even though it's clear that the spray used in tropical countries eventually makes its way up here—because some of those countries rely on DDT to fight malaria. We need to help them find a better way to fight malaria in order to eliminate the use of DDT.

"We also need to make sure that everyone understands the consequences of DDT use in the tropics. We have to make our case on the basis of solid, scientific data.

"We have to be able to say to them: 'This is what we found. These are the hard numbers. These are the facts about air-borne and water-borne pollutants. This is where the problem is coming from. And now let's find a solution.'

"The Department of Indian Affairs and Northern Development has used the Northern Contaminants Program research to help convince the international community about the need to act. We need scientific data if we are going to make a strong case for global controls, phase-outs, and bans of these contaminants.

"We're not alone in gathering the data and presenting these arguments. Ambassador Mary will be working with the Arctic Council which has assumed the responsibility that the eight circumpolar countries had taken on for the Arctic Environmental Protection Strategy.

"Part of the Strategy is the Arctic Monitoring and Assessment Program, or AMAP, which monitors the levels and assesses the effects of pollutants in the Arctic environment. Canada will continue to work with AMAP. We're going to publish our Canadian findings on Arctic contaminants research in early 1997, and this will constitute a major contribution to the circumpolar AMAP assessment to be published later in June 1997.

"Another part of the Arctic Environmental Protection Strategy calls for international action on persistent organic pollutants. I am pleased to tell you that negotiations are underway to develop a legally binding agreement under the Convention on Long-range Transboundary Air Pollution. In January 1997, the United Nations Environment Program Governor-in-Council will decide on whether to initiate work on a global agreement dealing with some of these substances.

"So these two steps—to clean up our own act in Canada, and to keep the pressure on the international community—are two of the decisions we can make here and now in Canada.

"But there's another important decision that we've had to face in the very short term, and that is what to do about Canada's Arctic Environmental Strategy now that its six-year mandate is about to run out.

"Back in 1991, when the AES was implemented, the government of the day didn't realize the extent of some of the environmental problems. The clean-up of hazardous waste sites within the territories and the need to keep on top of contaminants research remain priorities.

"If we need to continue building our database, we need to build on the gains we've already made in controlling contaminants and to keep the pressure on the international community. We must continue to accumulate the evidence that will force other countries to start looking for other environmental solutions.

"Some time ago, Minister Irwin asked for an evaluation on how effective the AES has been.

"The evaluation concluded that the contaminants part of the Strategy was among the government's most significant accomplishments to date North of 60 °. Among other things, it strongly recommended the continuation of the work in the area of contaminants research through partnerships.

"And so Minister Irwin concluded that the contaminants program must be continued. As the AES monies were never part of his Department's permanent budget, he is now trying to clarify where the funds are going to come from, but I am convinced this program is just too important not to continue.

"We will need multi-year sustainable funding. That's what it's going to take for successful action nationally and internationally. And Minister Irwin is going to continue pushing for this.

"But in the meantime, we can take satisfaction that Canada has been doing many of the right things. We've taken the steps to ensure that we're not part of the problem. And we're continuing to gather the data and information that will help us present our case to put pressure on other countries.

"But just as important, we're building a foundation for community action here in the North. We must continue building our partnerships, and giving Northerners a stronger voice in the issues that affect us so profoundly.

"Thank you."

Presentation by Hon. Stephen Kakfwi, Minister of Resources, Wildlife, and Economic Development, Government of the Northwest Territories

"Thank you, Mr. Chairman. I appreciate the invitation to address this conference on contaminants in the Arctic, a subject that is of great concern to the North and northern residents. This issue is of grave concern to me because it continues to be a problem without any apparent progress in finding a lasting solution.

"I will leave the discussions on contaminants to the participants at this conference who are experts because of their knowledge of the cause and effects, or who, together with your friends and families, live with the consequences of contamination of arctic resources and the environment. All of you have a great deal to contribute to the deliberations and recommendations arising from this conference. I look forward, as Minister of Resources, Wildlife and Economic Development, and as a northern Aboriginal person, to your conference report.

"Today, I would like to focus on the changing circumstances we find ourselves in as politicians, researchers, and citizens, and to the potential consequences of this new 'environment' on the future of polar science and to open debates such as the opportunity presented by this conference.

"We are all aware that the existence of the Polar Commission is being challenged. The Inuvialuit Regional Corporation and the Gwich'in Tribal Council have recently written to Premier Morin asking that the mandate and future of the Commission be reviewed. These challenges prompted me, as Minister responsible for N.W.T. resources and the environment, to review the reasons why the Polar Commission was established in the first place and whether those reasons still had merit.

"I concluded that not only did they still have merit, but possibly are more critical in today's circumstances.

"I believe consideration of this issue is important because those interested in polar science and open debate want to see continued co-ordination, co-operation, and exchange of views on issues of importance to the arctic region of Canada, such as the subject we are discussing today. There have also been a number of initiatives over the last year that make such an evaluation timely.

"The on-going relevance of the Polar Commission was evaluated by the federal government during its agency review, under the leadership of the Honourable Marcel Masse, President of the Treasury Board. A review of federal agencies was initiated to eliminate inactive or unnecessary agencies and to streamline the remaining ones wherever possible. The Polar Commission was not immune to this federal review.

"While the Polar Commission was scrutinized and was affected by this review, the decision of the federal government was to reduce the number of board members but it obviously saw the merit in continuing the operation of the Commission's activities.

"Secondly, the recent establishment of the Arctic Council and its relationship with the work of the Polar Commission should be considered. Canada took the lead in promoting the establishment of an Arctic Council and will provide support for the Council in its first two years. Among other information, Canada's representatives on the Council will need a current and consistent overview on the state of arctic research in Canada, as well as Canada's policies and activities in the field of international polar research.

"Other initiatives undertaken by government in the name of deficit reduction have impacted on polar science, the lives of northerners and on the activities of agencies such as the Polar Commission. I was Minister of Renewable Resources in the Government of the Northwest Territories at a time when financial resources were not limited in the manner which we face today.

"As Minister of the newly amalgamated Department of Resources, Wildlife and Economic Development, my current responsibilities and choices are very different. Today as politicians, researchers, scientists, and citizens we find ourselves in a new 'environment'.

"What do we as northern and Aboriginal people want today? We want access to research and development. We want to be partners in that research and development. We want the research and development to be co-ordinated and based in the North.

"What do the environmentalists want? They want good quality research, they want it co-ordinated, and they want a clear financial commitment to it.

"What do developers want? They want to be sure that the basic research is done now and not on an ad hoc, project-by-project basis.

"What do southern Canadians want? They want to know there are clear national priorities on arctic and polar research. They want a clear, comprehensive approach towards keeping the North strong and clean.

"How can these needs be fulfilled in today's environment?

"Governments and non-government agencies are all finding themselves in a fiscal crunch. New money is the exception rather than the rule. Downsizing, elimination of overlap and duplication, effective, efficient, and affordable have become the key phrases of the workplace. While this has placed incredible stress on the various systems, programs, and especially employees, it may not be all bad. It does force a re-evaluation of what is important—What are our priorities? It also provides an incentive to increase co-operation to achieve the most with limited resources.

"The report The Shield of Achilles *prepared by Professor Tom Symons in 1988, calling for the creation of a polar research commission, anticipated these requirements. His analysis and conclusions are as relevant today as they were when he wrote them.*

"Professor Symons expressed concern about the state of polar knowledge in Canada, indicating that the 'great diversity and widespread dispersion of those engaged in research in and about Canada's polar regions has slowed and handicapped the development of a strong and effective Canadian polar research community'. He recommended the establishment of a polar research commission to promote the development and dissemination of knowledge in and about the North. His proposals had widespread approval within the polar research community.

"In 1988, when The Shield of Achilles *was released, the report indicated that there were over 100 agencies engaged in arctic research, but that there was a striking lack of knowledge about what was and was not being done in many fields of polar research. The report also was concerned about the remoteness and alienation of northern Canadians from most Canadian polar research and national affairs.*

"Since that time, the number of agencies undertaking polar research has increased but the financial resources available for those activities has decreased.

"On the positive side, steps have been taken to include northern and Aboriginal people in the development and conduct of research activities. Traditional Aboriginal knowledge has been recognized by the scientific community and developed as an essential element of research conclusions.

"Research is being viewed in a broader context, with consideration being given to economic and social matters as well as the unique inter-relationship of issues and processes in the Canadian North. For example, moving ahead on a protected areas strategy became one of the important considerations of government, northerners, environmentalists, and developers within the context of the BHP Diamond Project.

"There is now clearer recognition of the role of northern residents in the formulation of research and development policies. N.W.T. Aboriginal claim final agreements and implementation plans require governments to seek the advice of joint government/Aboriginal renewable resource boards in policies respecting wildlife research and the evaluation of wildlife research in the claims settlement areas. Many of the settlements make provision, including financial resources, for research and harvest studies. There is agreement that the resources boards, and government departments and agencies will work in close collaboration and exchange full information on their policies, programs and research.

"Governments are also recognizing the benefits of internal co-operation. For example, federal government departments with northern science and technology interests are working together at the Assistant Deputy Minister level to enhance and improve co-ordination of federal northern science and technology activities.

"The Government of the Northwest Territories has recently amalgamated the activities of the Departments of Renewable Resources; Energy, Mines and Petroleum Resources; and Economic

Development and Tourism. The joining of these departments into the Department of Resources, Wildlife, and Economic Development provides for an interactive balance between resources, the environment, and economic development at all levels of decision making.

"All of these things are steps in the right direction, but there is an ingredient missing—that of overall co-ordination, monitoring, and dissemination of knowledge that encompasses all activities and agencies engaged in research in or about Canada's polar region. In the mind of Professor Symons, this would be the role played by the Polar Commission.

"The Chairman of the Polar Commission tells me that the federal government spends up to $7 billion on research and development in Canada, but there is no accounting of how much is spent on polar and arctic research. There is an irony in this apparent lack of interest in northern research even though the North geographically represents one-third of Canada and for many Canadians is viewed as a storehouse for future generations.

"It is time for Canada to turn its attention to the North. More so than at any time in the past, it is important that all agencies and individuals should be aware of what is and what is not being done by their colleagues in the many fields of polar research. Limited resources should be identified and channelled in the most productive way avoiding unnecessary, or unknown, overlap and duplication of effort. The Polar Commission could assist in bringing these diverse communities together and provide an annual overview of resources and Canadian polar research.

"Professor Symons was clear that the Polar Commission 'should not undertake initiatives that duplicate the responsibilities or effort of others, or even that could be better performed elsewhere' nor should it 'pronounce upon northern policies' or 'exercise administrative responsibilities'. He was concerned that the Polar Commission maintain an independent and credible role as the centre of information and communication on polar issues.

"The Polar Commission, as catalyst and promoter, disseminating information, monitoring activities, advocating co-operation, and increasing shared knowledge within the research and northern communities can provide a useful service for the various governments and agencies in encouraging their co-ordinated management of northern science and technology and in making the best use of the resources available.

"In conclusion, the interests of the Government of the Northwest Territories are similar to those of northern and Aboriginal people, environmentalists, developers, and southern Canadians. What does the Government of the Northwest Territories want? We want a commitment to development and an orderly, co-ordinated approach to research and development. We want a long-term financial commitment to research and development activities in the arctic region. While recognizing that we all have responsibility toward the achievement of this goal, we want the federal government, as a first priority, to undertake this commitment in partnership with the people of the North."

Presentation
"For Generations to Come: Canada, Contaminants, and Circumpolar Co-operation"

Presenters: **Sheila Watt-Cloutier, *Inuit Circumpolar Conference***
Terry Fenge, *Inuit Circumpolar Conference*
Commentators: **John Rayner, *Department of Indian Affairs and Northern Development***
John Stager, *Canadian Polar Commission*

Sheila Watt-Cloutier of the Inuit Circumpolar Conference spoke of the importance of country food to Inuit and of the need to view the problem of environmental contaminants in relation to Aboriginal peoples' lifestyle.

"The issues of contaminants can't really be isolated from the other challenges that we are facing as a people," she said. "You can't really be treating it separately, as though it were an issue unto its own. It is still very much the same package that we face today and that we confront on a daily basis, because health is not, after all, just an absence of disease. We know that it is a delicate balance of the physical, emotional, and spiritual and well-being for us."

"Fear has been talked about a fair amount in these last two days. Understandably, my fellow Inuit passionately spoke about this fear, because, after all, we know it is fear that has had devastating effects and has haunted us since we have had contact from the outside world. It is the fear and the confusion that has readily led the way to the despair that is happening in our communities. Instilling fears about contaminants now in the food-chain just adds to the already existing fears regarding lack of housing, lack of good health care, some of the deficient justice and health education systems in our communities, blanket gun control laws that keep our hunters afraid whenever they are going to go out and hunt for our people...the list goes on.

"These fears certainly do keep us in that state that I talked about: powerlessness. So, if we are powerless, I have a strong hunch other people are feeling rather powerful. Same old story, just some different colours. Again I get back into the issue of denial; I think some people tended to assume yesterday that when we talked about not giving up our country food and clearly spoke about these issues, that these people must still be in denial over contaminants in their food. Not at all. In fact, you heard some of the people speaking, including Norma, who clearly talked about these issues, Joe Kunuk on these other issues that we are inflicting on ourselves—the issues of alcohol and drug abuse. So, we are certainly not in denial over these issues, and we are moving forward on all of these fronts. But, you are hearing a balance and you are certainly hearing it from the Inuit voices that have been here this week."

—Sheila Watt-Cloutier

Ms. Watt-Cloutier noted that information is an important component in dealing with contaminants, but she stressed that it is only a beginning. Empowerment is the ultimate objective and the most effective means by which Inuit and other Aboriginal peoples can address issues such as contaminants.

"Empowerment is the ability for us, as individuals and communities, to effectively control our own learning and development like we once used to do, and I think that is what this is all about for us as a people," she explained. "We had our own education, justice, and health systems, controlling all of these things ourselves from our own indigenous wisdom, and indigenous wisdom always leading the way. So, we certainly knew what we were doing....There has to be an integration into intelligence, understanding, and, ultimately, to wisdom. If we just keep things at the data and information stage, we remain, I would say, quite dependent on all kinds of things. But if we move on to a full understanding and wisdom about these issue areas, then we can make some very profound independent choices in our lives. It is with this that I think we have to move beyond just data and information about all of these issues."

Ms. Watt-Cloutier said the World Health Organization and similar groups must come to understand that the reclamation of indigenous wisdom is a process that will reap the greatest benefits for Aboriginal populations.

"Without that input and that kind of focus, the world really does run the risk of operating under the illusion that it is helping when actually, sometimes, the reverse is happening," she said. "The dominant world will continue to be baffled as to what really ails us, despite the fact that they provide a lot of money and effort to try to help us. This very expensive and ineffective aid only perpetuates our problems and, in my opinion, is another subtle form of the big 'C word'—colonialism. In fact, this subtle form, in the appearance sometimes of true help with lots of funds attached to it actually keeps us and the donors stuck in a very non-productive form of dance, even destructive at times."

Terry Fenge of the Inuit Circumpolar Conference said the conference had shown clearly the benefits of partnership arrangements such as those established under the Northern Contaminants Program.

"There seems to be a significant level of trust and co-operation between civil servants in a variety of agencies and Aboriginal organizations," he noted. "I would suggest to you that this is a very important development. It certainly has not always been that way, and one of the tasks that faces us in the future is building upon that level of trust and co-operation."

Mr. Fenge observed that the current debate on the most appropriate means of communicating information about country foods must not be allowed to detract from the urgency of the situation.

"On the one hand, people want to provide clear, clean, accurate information to people in the communities about the issues at stake here, with the general recommendation for the need for

dietary modification," he said. "However, these recommendations, this information that is being imparted, is being done so within a broad framework of encouraging people to retain eating country food. So, there is a note of reassurance there as well as a note of alerting people to the issues at hand.

"At the national level and the international level, the message that has to be put forward is not one of reassurance; it is one of urgency and the need to come to grips with these issues. If you will, perhaps the former strategy is, to quote Sheila, an interim strategy; it is a short-term strategy, a coping strategy. What we really need to do now, I believe, is to re-focus our efforts from that coping strategy into a longer-term political and change strategy that can only be conducted at a national level, at a circumpolar level, and at an international level."

Mr. Fenge suggested that the broad strategies employed by Inuit in achieving their goal of a politically distinct territory in the eastern Arctic—Nunavut—might also serve to advance the environmental agenda, in particular, the problem of contaminants. Among the key elements are the following:

- clarity of position on the part of the Aboriginal leadership;
- a tenacity of purpose and a sense of continuity;
- success in appealing to the public at large rather than the federal interest alone;
- educating the media about the issues involved;
- forming strategic alliances and utilizing existing public institutions effectively; and
- securing adequate financial resources.

Mr. Fenge spoke of several developments likely to influence Canadian policy with respect to contaminants, such as the forthcoming release of the Canadian Arctic Contaminants Assessment Report and reports being prepared under the Arctic Monitoring and Assessment Program of the Arctic Environmental Protection Strategy.

"These are both going to be very substantial documents," he said. "They will provide the information base that we, and others, can use to appeal to the national interest within Canada, and to institutions that have a much broader jurisdiction, including United Nations institutions. We are very fortunate in having these two reports coming on stream quite quickly, and they are going to challenge us, because we will be challenged to use them correctly in the policy world."

Mr. Fenge said opportunities to promote the issue at the Cabinet level in Ottawa and through international agencies such as the Arctic Council should not be lost. At the same time, he stressed

the importance of making the issue "fundable" by targetting those private-sector interests—corporations, foundations, and other groups—prepared to assist. As well, he pointed out potential strategies for the near future, including the building of alliances with groups such as the Sierra Club and the utilization of high-profile fora such as the United Nations. He suggested that politicians from the North should be prepared to raise the issue in southern Canada.

"What if we think of asking Premier Morin to establish a committee of senior politicians from the North?" he asked. "Why don't those people constitute themselves as a committee and hold some hearings in the South? Why don't we get those people to call government agencies, to call environmental organizations, or to call foundations, to bring them forward to talk about this issue? Can the North utilize that as a tool to speak more fully and accurately to the South? If we decide to do that, we should focus very much on Toronto and Montreal, because that is where the real decision-making authority lies; it doesn't lie in Ottawa."

John Rayner of the Department of Indian Affairs and Northern Development expressed his general agreement with the views presented by Ms. Watt-Cloutier and Mr. Fenge. He noted, in particular the importance of alliances and partnerships between Aboriginal peoples and government.

"We have to work with the indigenous peoples of the arctic and form alliances with them, governments, indigenous peoples organizations, and groups outside the sort of government/indigenous peoples area," he said. "I think we have some models in the Northern Contaminants Program and also in the structure of the Arctic Council."

Mr. Rayner said there is growing public awareness of the environmental problems confronting Canada's North, and the Arctic more generally. National exposure has, in turn, led to greater awareness at the international level, a process Mr. Rayner compared to the campaign to sustain markets for Canadian fur products in Europe.

"We have learned a lot from that," he said. "It has not yet been crowned with success, although we dodged the bullet last year, and we are in the process of trying to ensure that that regulation is deferred or, in fact, modified to a point where it makes sense. There has been a great increase there in awareness of that issue, and it has taken a considerable amount of money, delegations going over, some print media work in Europe."

Mr. Rayner said pressure must also be brought to bear on industries—some of them Canadian—whose manufacturing processes include the use of substances harmful to the environment.

"Although most of these substances have been banned and are not being used in Canada and the U.S.A., some of them, in fact, are still being manufactured by Canadian companies and exported to developing countries and used there," he said. "In the technical specifications of aid programs by

international organizations, the way you write up those specifications sometimes dictates the kind of product that will bought under an aid program. So, there is a whole area there where there is a need to sensitize industry—including Canadian industry—about the importance of finding alternatives to these products and not relying on them in the future. If we are going to be successful in getting the protocols that will ban those substances, we need also to take into account the reaction and strategies that industry will be developing to meet the new world."

John Stager, of the Canadian Polar Commission, addressed his comments to several of the conference presentations, saying the issue of contaminants and related health effects presents a dilemma for society.

"The spread of knowledge and the limits to which that spread and enquiry can go seem to have no end," he remarked. "Without thresholds, it calls into question how we set standards, and that caused me a great deal of worry. I know that we have had a lot on standards and a lot of ways of approaching it, but I am concerned that it may be increasingly difficult to set

"I remember the press conference on the Arctic Council when I was explaining to a reporter why consensus for international issues was the best policy. She was having trouble understanding it, and I said, 'Well, you know in the United Nations...we only have persuasion; we only have the strength and knowledge of our arguments to persuade them—and some political tactics, I guess—but basically it has got to be done on the strength of the case itself.' If a country decides not to do it, not to ban certain substances, it will just simply not do it, and there is very little in this area that can be done to change that, so it has to be done through a process of dialogue, incremental, step-by-step, and discussion. For that kind of discussion, you need good, solid research. You need to have good communications and quality documentation, and then you need to have teams that are dedicated to go out and persuade and take the initiative. I think, on the contaminants issue, that we in Canada have been fortunate to have had that combination, with David Stone and the team that he has put together, because they have gone out and they have sought alliances. They have sought alliances with the developing countries in the UN, which is where some of the major issues are at the present time. The most surprising thing about that is that when you have committed public servants, along with committed indigenous peoples representatives on the delegation, and you go and make your case, people listen. One of the most surprising things about the UN discussions that are going on at the present time is that we have not had the reaction, as there was at Rio, to some of these environmental issues from the developing world. There is an understanding, a growing understanding, that this is their problem in the developing world as well as our problem in the Arctic, and we must jointly find a solution to it. I think part of that success was because it was clear that this was not just a government initiative, but that it was an initiative coming from the people of the Arctic as well. That was clear, and the developing world saw some resonance of their position vis-à-vis the world in the sort of make-up of the Canadian delegation when they came and talked to us. So, we have an alliance between the Philippines and ourselves to try and move that through the UN structure."

—John Rayner

standards on the basis of knowledge, and that we will be driven to consensus. I don't say that in a necessarily negative sense, because I guess, ultimately, in decision making in societies it is the body politic in some form or other that comes to the final conclusion. The need for consensus is, I think, very, very high."

Dr. Stager suggested that the creation of a "blue-ribbon" panel, comprised of experts in the field of environmental research may be one means by which to determine the seriousness of the issue, establish priorities, and help set the direction for future action.

"I rather like that kind of approach, the blue-ribbon approach, to come to some conclusion about some particular issue," he said. "I would like to urge that, when public questions of concern arise, that be brought into play because it is distinct, it is focused, and it can enhance the public debate on public issues."

With reference to the presentations by Dr. Béland and Ms. Watt-Cloutier, Dr. Stager defended the important role of universities as key centres for research, saying creativity and enquiry are essential elements in problem-solving.

"Sheila referred to the conflict in the academy and said, 'Get your act together.' Well, there will always be conflict in the academy and you are not going to get your act together, because that is the essence of thinking."

Dr. Stager agreed that the concept of partnerships is important; however, he noted that the efficacy of such arrangements with respect to the key requirements of contaminants research are sometimes questionable. A notable exception, he said, is the Centre for Nutrition and the Environment of Indigenous Peoples (CINE).

"CINE is an excellent example of that kind of partnership," he said. "I think there is an enormous intellectual resource that is out there and I think there is a lot of good will that can be harnessed to come together."

Magnus Magnusson, of the International Arctic Science Committee (IASC), described how the organization was founded by the eight arctic states in Canada in August 1990. Since that time, eight other non-arctic countries with significant scientific activity in the Arctic have joined the organization, bringing total membership to 16.

"I think it is fair to say that IASC represents the world community of scientists doing research in the Arctic," he said. "IASC has set up a science agenda based on certain guidelines, for instance, bringing together the physical, biological and social sciences, strengthening the dialogue between the science community and the policy community, and addressing the concerns of those who live only in the Arctic."

Dr. Magnusson explained that the IASC science agenda consists of four main parts: the impacts of global change on the arctic region and its peoples; arctic processes of relevance to global systems; natural processes within the Arctic; and sustainable development in the Arctic. Of particular relevance to the issue of contaminants are specific IASC initiatives such as "Environmental and Social Impact of Industrialization", "Disturbance and Recovery of Terrestrial Ecosystems", and "Rapid Cultural Changes in the Circumpolar North". Dr. Magnusson said the issue of contaminants is one of high priority for the Committee, and would be discussed with the IASC Executive at upcoming meetings.

Panel Discussion
"National Concerns and National Responsibilities"

Chair: **Jim Vollmershausen,** ***Environment Canada***
Panelists: **Mary Simon,** ***Ambassador for Circumpolar Affairs***
Stas Olpinski, ***Makivik Corporation***
Jon Grant, ***Canadian Polar Commission***

Jim Vollmershausen, of Environment Canada, began the panel discussion by highlighting instances of successful co-operation on environmental issues, such as amendments to the Migratory Birds Act. Although attempts to reform the legislation in the 1970s were largely unsuccessful, new approaches emphasizing partnerships between governments and Aboriginal peoples achieved the desired results.

Referring to earlier presentations stressing the need for information, he commented that the problem may be less one of quantity than organizations' capacities to deal with it.

"I think we are getting to the stage now where information is not so much the problem—there is lots of information out there," he said. "The real trick now is to cull through all that information and find the wisdom, the nuggets of wisdom that are really useful to help people make choices." Mr. Vollmershausen said the uniqueness of northern ecosystems argues for distinct approaches to research.

"Studies and experiences and so on from the South just cannot be extrapolated into the northern situation," he said. "It is important to work on this issue at all levels—international, national, regional, and local. An understanding of the contaminant sources and their movement is essential to setting some priorities for action at all those levels."

"One of the things that was really good for me being here was listening to some wisdom. I came here a bit unsure about what would happen, but I was anxious to hear nonetheless what some of the best-informed people would have to say on the subject of contaminants in the Arctic, those people being some scientists but also some northerners. I must say that I have heard some really useful and revealing information. Scientists like Theo and Derek have presented some really solid information that we should all take on board and use, but we have heard northerners speak from the heart about changes that are occurring in their environment and threatening their way of life and, as we heard quite eloquently, even their identity. I guess it is really too bad that all those in a position to make decisions about what happens in this part of the country couldn't be here to hear all of that, but I am equally sure that one of the missions of the CPC is to take all that information, pleadings and so on, South. I am sure they will do that."

—Jim Vollmershausen

Mr. Vollmershausen said there is no question that contaminants must be considered a priority not only in the North but for Canada as a whole. But the extent to which solutions are applied will depend largely on the maintenance of existing capabilities for research and monitoring.

"Research and monitoring are fundamental to understanding how contaminants enter the ecosystem, the arctic ecosystem, and what happens to them when they do," he said. "There is concern out there about how that kind of research and monitoring will continue in a time of shrinking resources. How will information continue to be communicated? The knowledge base, both technical and traditional, must be maintained, and preferably expanded. The AES addresses a number of areas of concern at the national level, including contaminants from distant sources and waste at abandoned sites, but how will priorities for action continue to be set, given budgets?"

Mr. Vollmershausen concurred with the general view that the Arctic Council represents an important step forward in developing consensus and co-operation at the international level. He added that the Commission on Environmental Co-operation, established under the North American Free Trade Agreeement (NAFTA) is another forum in which Canada can effect change; recently, the Commission passed a resolution on sound management of chemicals, including specific action plans for substances such as PCBs, DDT, chlordane, and mercury.

Environment Canada, for its part, has been actively involved in the clean-up of weather stations and other installations in the Arctic, in inventorying toxic substances, and in research on specific substances. He noted, as well, efforts by the federal government to co-ordinate better departmental programs and planning related to science and technology in the North.

"Coping with that work, in fact, has helped Environment Canada get its own internal act together," he said. "I think in recent weeks we have been able to generate some initiative at the Ottawa level of our own department that I think is going to help us move our northern agenda along...I am working hard to get that particular act together for us and, hopefully, it will help us and our colleague departments get things better together. A lot of chatter about how to co-operate when resources are going down—partnerships and so on—becomes really important."

Mary Simon, Canada's Ambassador for Circumpolar Affairs, reiterated some of the themes brought forward at the conference—communications, information and education, and partnerships. She spoke, as well, of the need to deal with contaminants from a holistic perspective that encompasses the Aboriginal way of life.

"Some representatives said that this is important because, when we look at the question of contaminants, we are looking at the living resources that humans depend on, particularly Aboriginal peoples, for their spiritual, cultural, and health well-being. This goes to the very root of the Aboriginal way of life, because without the importance of culture and spirituality, this whole question could be dealt with just as a food source, but it is much more than just the food source."

Ambassador Simon emphasized that governments must be prepared to support research and remediation programs both politically and financially. Vague assurances of continued support will not be adequate to support the type of long-term commitment required to deal with the problem of contaminants.

"I think we need to set out a clear long-term national commitment to research, to analysis and communications on the environmental and health effects of contaminants," she said. "This policy should encompass the strength of the AES program, and it should also incorporate many of the main concerns and suggestions that we have heard in the past two days. This initiative also becomes the cornerstone of our international work."

"It is the scientists that are studying the question of contaminants, but it is also the people that are telling us that there are no more migratory birds in certain areas, that the liver and the kidneys of animals like caribou are showing disease. The hunters don't have to be told by scientists that these animals are sick; they know they are sick because it is something that people see. So, how do we utilize this kind of knowledge with that of science? That has been a real dilemma in the work that I have done over the past 20 years. The scientific community works on the basis of reports and written material, which is their field, and there is nothing wrong with that. Traditional environmental knowledge is very oral in nature, and it comes from people's experiences, and not necessarily on an analysis basis. When there is a choice that has to be made, the traditional knowledge falls off the table and it is the hard science that gets considered. I am not trying to blame any one group, but I have been in situations where that has happened over and over again. I think we have a collective responsibility to try and see how we can utilize both these knowledge bases, and I think the AES can be used as an example of how this can be done, because it really means involving people. You can't go to a filing cabinet and pull out sheets of paper that describe what traditional knowledge is. It is what people possess, and then you have to be able to use that knowledge in discussions and so on. I think partnership and working together is one of those very important areas and, through the Arctic Council, we are trying to build that aspect as well."

—Mary Simon

Ambassador Simon said the challenge for Canada, holding the initial chairmanship of the Arctic Council, will be to develop a Council that is effective in resolving the goals of environmental protection and sustainable development.

"People often say that environmental protection is included in sustainable development, and it is; there is no doubt in our minds that when you refer to the term 'sustainable development' you have to have strong environmental goals. But, in the Arctic Council negotiations, we specifically outlined both those areas because we didn't want any misunderstanding that when we talked about sustainable development we were also talking about strong environmental goals. Many of the countries felt that sustainable development was a way of opening the doors to the Arctic for outright development, and that is not Canada's objective.

"Canada's objective is to establish a program from which the arctic states and arctic peoples can move forward to develop co-ordinated and balanced policies to serve their evolving interests and needs with a particular focus on providing for those elements of protection and restoration necessary for achieving sustainable arctic economies, cultures, and societies. Sustainable development has been very much a people-centred concept in the Arctic Council discussions."

She noted that Canada is now in the process of developing a paper for the Arctic Council which will draw together much of the current thinking with respect to environmental research, including work done by the Arctic Environmental Protection Strategy's sustainable development and utilization

working group. The paper is to be presented to the upcoming meeting of Council members in Norway. While Ambassador Simon expressed optimism that the creation of the Council marks a milestone in international Arctic relations, she cautioned that expectations should be tempered by reality.

"The Arctic Council is not going to be the answer to all the ills of the North," she said. "Far from it. How effective the Arctic Council will be will depend on the level of commitment governments are going to make to this initiative. It could be an effective organization, or it could be a very ineffective organization, depending on how much political commitment there is."

Stas Olpinksi, of Makivik Corporation, said it is important to recognize that indigenous peoples are not about to stop eating traditional food; its place at the heart of northern Aborginal society is, in fact, "that element that fundamentally distinguishes them from non-indigenous people".

At the same time, Mr. Olpinski endorsed efforts to provide accurate information on contaminants and food safety to northern communities, so that individuals are free to make informed choices about their respective diets.

"Such information engenders control that each individual has in the decision-making process," he said. "By contrast, absence of such information fosters uncertainty, misunderstanding, and fear itself which is both debilitating and leads to dietary choices which may not be either appropriate or necessary."

Mr. Olpinski cited the example of the James Bay Cree who restricted their intake of various freshwater fish owing to fears of high methylmercury levels; however, the resulting change in diet

> *"I believe it was three years ago when hunters killed an ice-entrapped bowhead to satisfy the cravings of an Inuk elder. They knew their action might bring personal censure or indeed lead to legal intervention, yet they did it knowingly, to meet an elder's wishes. As so clearly stated, there are no farms in the Arctic to raise chicken or beef; their arctic equivalent is ptarmigan and free-ranging caribou. Nor are there fields of wheat or corn, nor really any arctic equivalent since diet has been and continues, for the most part, to be meat-based. So, when faced with a quandary of eating food that is familiar, that is nutritious, that is sustaining and heat-giving in winter versus eating such food with a risk that it may bear some contaminants with undefined effects on human beings, then the resounding answer by the indigenous participants has been 'eat it'. That is not to imply that we mustn't all be vigilant and attempt to address the issues of research to obtain the information so that answers can be given. Is this food, this seal meat or muktuk, safe to eat? It does mean that pan-Canadian, or perhaps global, standards for contaminant loading must be defined that are consistent and yet relevant to the context of an indigenous diet which is primarily meat-based. Until such time, it is my view that there is really no other choice for these people but to continue with the current diet, as alternatives are neither obvious nor cheap."*
>
> —Stas Olpinski

has led to a number of diseases previously unknown among the local population, including a high incidence of diabetes.

Turning to the broader context, Mr. Olpinski said the fact that the contaminants confronting Aboriginal northerners come primarily from outside sources means the problem must be viewed as a "pan-Canadian" issue as well as one of global proportions. However, he noted that local action is often the best course for effecting change.

"To focus back on the subject, at the lowest common denominator, I believe it is fair to say we end up at the community level," he said. "The appropriate mechanisms and organizations for dealing with the contaminant issue, at a community and regional level, are being established across arctic Canada, albeit perhaps there is not yet parity throughout."

Mr. Olpinski said community-level action may become even more critical in coming years as governments continue to reduce departmental research budgets. Referring to a recent meeting sponsored by the Department of Fisheries and Oceans in Winnipeg, he observed a general consensus on the need for continued research but noted, as well, the intent to shift at least a portion of financial responsibility to co-management groups.

"An underlying message was that monies held by the co-management groups was now going to be an important source," he said. "This is of particular concern to me, as Nunavik and Labrador are without such monies...However, it is my view that governments still have both fiscal and fiduciary responsibility in this regard."

Mr. Olpinski said a possible approach is to locate research and monitoring infrastructure in the North. He described Makivik's efforts to establish a facility at Kuujjuaq capable of conducting analyses for the presence of heavy metals in wildlife samples.

"This approach fits directly the community-based process which was highlighted in Winnipeg, and has been spoken of here by many persons over the past days," he said. "This permits direct local involvement, instils confidence and, I believe, is more efficient. This, of course, only deals with one group of contaminants. Nor does it take away from the need for peer review, nor for analyses conducted for the suite of all other contaminants in the Arctic. Such work must still be conducted under the auspices of facilities such as those in Winnipeg, Burlington, Laval, and at CINE. What needs to be done, however, is to co-ordinate this process to avoid possible duplication and to ensure that priorities are acted on."

Mr. Olpinski said he was heartened by assurances from the Minister of Indian and Northern Affairs that funding for contaminants-related research will continue to be made available after the "sunsetting" of Green Plan programs in 1997. However, he expressed concern about the "imprecision" as regards the source of funding. Noting that "pollutants do not adhere to political or

jurisdictional boundaries, he called on the Canadian Polar Commission to press the federal government on the inclusion of Nunavik and Labrador in any future contaminants program.

Jon Grant, of the Canadian Polar Commission, expressed his concern that the reputation of Canada as a world leader in environmental management is sometimes at odds with the "cry for help" heard from northerners.

"We've got so much to give this world in terms of resources, and so little money to do it," he said. "Yesterday, I guess it was, the Minister of Finance told us that he was exceeding the deficit reduction programs in Canada by a wide margin. In my view...it is time, whether through the CPC or other groups in Canada, to say, 'Let's put some money back into our Arctic to help reduce the contamination problem, to improve the health', and then take the same efforts and work that we put together and help the people, for instance, in northern Russia accomplish the same goals within their communities."

> *"This August, I was on the Lena River in northeast Russia, and I have to tell you the same thing was happening as we went up and down the river. People were saying how can Canada help us with the problems we have in terms of contamination on the river systems and in the air, because you people are so good at it. I sat there and thought, what the heck are we talking about. We are such a great country and we've got so many resources and so many good people, but I'm hearing two themes today and for the last couple of days. I hear all the good things that we, as the people and government of Canada, are doing for you. Then, I am also hearing people from the North say, my goodness, we've got a problem and there is this cry for help. The two don't connect. They are not connecting in the kind of way that I suspect a lot of us would really hope to."*
>
> —Jon Grant

Summary Remarks

Dr. E.F. Roots, *Environment Canada*

Fred Roots, of Environment Canada, provided participants with a short history of contaminants research in the Arctic, from early speculation on the transport of volcanic dust in the atmosphere to the Comité Arctique's 1978 conference entitled *The Arctic Ocean: Its Environment and the Fate of Pollutants*—the first international science conference to be held in the Arctic in modern times.

He noted, however, that the the Polar Commission's *For Generations to Come* conference did not arise from scientific concerns but from growing public concern on the part of northerners about the state of the arctic environment.

"As the indigenous people of the North naturally depended directly on the natural food chain through which the contaminants could accumulate, and the concentrations could become magnified,

the grounds for concern were seen to be genuine," he said. "Amid all of this fuss, the Canadian Polar Commission recognized the need for a well-informed and in-depth discussion on the depth and the basis of these concerns, and those discussions would have to include people at large, the concerns amongst the scientists who were studying the problems, concerns among the administrators and regulators who had to make and enforce the policies that had a bearing on these problems, and concerns amongst the people who had to find the money for it."

> *"We said, when we were trying to put this conference together, that we had to tread the line between being overly dramatic and overly reassuring, and neither a bad nor good conference. In fact, we said that the purpose should be to make people sufficiently worried that they lay awake at night and determined to get up in the morning and do something about it, but not so scared that they pulled the covers over their heads and didn't do anything. I think that's what we are trying to judge, whether we were successful in doing that or not. I think that, to their great credit, the planning committee came up with a series of activities, which were the three regional meetings and this final conference which we are now coming to the end of, in a way that was really very effective."*
>
> *—Fred Roots*

Dr. Roots provided a review of the conference, highlighting the key points made by individual speakers and summarizing the themes addressed by the panels. He suggested some general points:

- Contamination is everyone's problem; local and international aspects cannot be fully separated, nor can contaminants be isolated from other issues. It is important, as well, to keep in mind that Canada was an active Cold War player; thus, while the United States may have been responsible for many of the military installations in the North, it is not solely their problem. "People forget how frightened we might have been that ICBMs were aimed at Montreal, Toronto, and Quebec City," he noted. "This is part of the price the country pays. People who lived here, of course, were not involved, and that is one of the inequities of it. But, it is a Canadian problem; there is no question about that."

- In dealing with contaminants, it is essential to adopt a very broad definition of "Arctic" and "North". These issues cannot effectively be addressed in a narrow jurisdictional context.

- The Arctic Council presents an excellent opportunity for addressing the contaminants issue in a high-level, international forum; however, it is important to remember that "the job is only well-started or half-done".

Dr. Roots said several items touched on during the course of the conference merit a more in-depth discussion. For example, it is important to examine how scientists can actually learn from the reactions of different communities to the issue of contamination. The synergistic effect of combinations of chemicals must also be studied more closely in future, as must the additional stress on ecosystems imposed by coming climate change. Referring to Ambassador Fraser's comments at the outset of the conference, Dr. Roots suggested that more work must be done on estimating the scale of effort and cost required to deal effectively with the problem.

Dr. Roots presented six recommendations, based on the proceedings of the conference:

1. Funding for research and communication on arctic contaminants must be continued. Following on the work begun with the National Contaminants Program, there must be a renewed commitment to addressing the contaminants problem. "We have gone as far...as the physician diagnosing the problem," he said. "Now, we have to look for the cure."

2. Future action must build upon the ideas of partnership, credibility, and trust developed between government, local communities, and the science community under the Arctic Environmental Strategy. Piece-meal actions by particular departments or institutions will not be effective in preserving this co-operative approach.

3. Northerners, communities, organizations, and individuals must be involved in framing the questions used to establish research and monitoring priorities. As well, they must be involved in research, monitoring, and communications.

4. In times of financial constraint and organizational devolution, it is important to co-ordinate both research capacity and the means by which messages about the consequences of findings are delivered.

5. Education and training must be built into any process for dealing with contaminants. The scientific community must be willing to learn from those who have a different kind of knowledge. They must listen to nature—not just study it as an abstract concept or through a narrow focus. For their part, northerners must learn how to accommodate new situations within traditional views. Public authorities must recognize that the process is long-term, and not amenable to quick results.

6. Proper attention should be accorded both local sources of contaminants and international transboundary pollution sources, albeit with different strategies. One should not be allowed to take priority over the other.

While Dr. Roots said plain-language explanations of contaminants and their effects on people and nature are helpful, he warned that putting complex issues into an "easy-to-understand" format is difficult.

"I think we fool ourselves," he said. "It is not an issue that is easy for ***anyone*** to understand. We have to put it into terms in which the complexities and the dilemmas can be appreciated and acted upon, but don't fool ourselves and think that this can be put into easy language."

Dr. Roots said northerners should be encouraged to take the message on contaminants to a world-wide audience, through whatever means are appropriate. Citing the success of Aboriginal organizations in having traditional environmental knowledge recognized in the Agenda 21 document produced for the 1992 Rio conference, he suggested that the Arctic Council affords an excellent opportunity for action.

In closing, Dr. Roots noted that the unique character of the Arctic, summarized in four short points, should be a part of campaigns designed to elicit support for contaminants research and action at the international level.

- The Arctic is far from sources of industry and population centres, but the region is central to all in terms of global importance.
- The Arctic is both a homeland and a frontier for those who want to use it in various ways.
- The Arctic environment, while harsh, is also sensitive.
- The Arctic is a region of opportunity, and worthy of the greatest care.

Closing Remarks

Hon. John Fraser, *Conference Co-Chair*

John Fraser thanked Dr. Roots and the members and staff of the Polar Commission for their work in putting the conference together. He spoke of the need for hope in dealing with contaminants and problems of equal magnitude.

"It is trite to say that without hope there is really nothing to look forward to," he said. "But if one considers that it is easy to get up and give a litany of all our woes...then, you've just sent your audience home; they curl up, and they don't want to get up in the morning and do anything. So, there must be a message of hope. Certainly, over the last several days, there was plenty said and plenty observed that gives us a reason to believe we can do something about this."

Ambassador Fraser reminded participants, too, that the issue goes beyond contaminants and their effects.

"It is not just contaminants," he said. "It is the behaviour of fellow human beings on the globe. It is essentially a moral issue, because it is the activities of people in one place and how those activities affect others. There is a moral quality to this issue.

"The other thing, of course, is that just because the problem is difficult, there is no reason to back away from it. Sometimes, to get things done requires just intellect and concern and a sense of the moral quality of the issue, but it also requires some old-fashioned courage. Churchill was once asked, 'What is the greatest quality a person can have?', and he said, 'Courage, because it guarantees all other attributes.' I think if we keep these things in mind, we can take what we have done here and go on and find some results that are not only appropriate but are worthy of the people of this part of our magnificent land and this part of the earth we all inhabit."

Recommendations

The Canadian Polar Commission recommends that the federal government establish a new national, northern contaminants program to safeguard the environment of the North and the health of northern peoples. Research and monitoring should be premised on the need to maintain high standards of health in northern communities and should, through direct participation and communication, enable northerners to exercise cultural and lifestyle choices in their own best interests.

The Commission further recommends that a "blue-ribbon" panel be struck to ensure that:

- northern risk-assessment and exposure guidelines are established, based on the best human health information available, and take into account northern traditions, life cycles, cultures, and socio-economic situations;
- mitigative and preventative actions encourage self-sufficiency within northern communities through training, education, and the establishment of infrastructure for testing, recycling, and waste disposal;
- program activities anticipate and promote the full involvement of both Aboriginal and non-Aboriginal northerners in all stages of the research and communications process, including the development of the research agenda, the analysis of findings, and the communication of results;
- future action builds on established partnerships among government, communities, non-governmental, and Aboriginal organizations, similar to those developed under the existing AES/NCP; and
- a renewed Northern Contaminants Program speaks to the prospects for youth and generations yet to come, and, through the development of school curricula and awareness programs, educates those who will inherit today's legacy.

The Commission recommends that the Government of Canada, as an arctic state, exercise its best efforts to providing leadership and encouraging co-operation in the international community for the reduction, elimination, and prevention of chemical contaminants. In doing so, the federal government must seek the active participation of, and partnerships with, the Aboriginal peoples of the Arctic and other public interest groups in Canada who are attempting to address this issue.

Conference Agenda

CANADIAN POLAR COMMISSION

For Generations to Come
A Canadian Conference on Contaminants, the Environment, and Human Health in the Arctic
October 8–10, 1996
Iqaluit, N.W.T.

Tuesday, October 8
Morning
(Astro Theatre)

10:00 a.m. –1:45 p.m.	Registration

Afternoon
(Astro Theatre)

2:00 p.m.	Welcome/Introduction Whit Fraser, Chairman, Canadian Polar Commission
2:15	Welcome Joe Kunuk, Mayor, Municipality of Iqaluit
2:25	Appreciation/Introduction of Conference Co-Chairs Whit Fraser, Chairman, Canadian Polar Commission
2:30	Opening Address Hon. John Fraser, Ambassador for Environment/Conference Co-Chair
2:45	Appreciation/Introduction Whit Fraser, Chairman, Canadian Polar Commission
2:50	Opening Address Mary Simon, Ambassador for Circumpolar Affairs/Conference Co-Chair
3:05	Introduction of Guest Speaker Mary Simon, Ambassador for Circumpolar Affairs/Conference Co-Chair
3:10	"Our Stolen Future: Contaminants and the Global Environment Theo Colborn, World Wildlife Fund, Washington
3:50	Appreciation Hon. John Fraser, Ambassador for Environment/Conference Co-Chair

4:00	Questions
4:20	Break
4:40	Introduction of Guest Speaker Mary Simon, Ambassador for Circumpolar Affairs/Conference Co-Chair
4:45	"Northern Contaminants: The Canadian Context" Derek Muir, Freshwater Institute, Department of Fisheries and Oceans
5:20	Appreciation Hon. John Fraser, Ambassador for Environment/Conference Co-Chair
5:25	Questions/Open Discussion
5:45	Announcements/Instructions Hon. John Fraser, Ambassador for Environment/Conference Co-Chair
5:50	Adjourn for Afternoon

Evening
(Discovery Lodge)

6:45 –7:15 p.m.	Refreshments
7:15	Welcome/Introduction of Elder(s) Mary Simon, Ambassador for Circumpolar Affairs/Conference Co-Chair
7:20	Lighting of *qulliq*
7:25	Dinner
8:00	Introduction of Keynote Speaker Mary Simon, Ambassador for Circumpolar Affairs/Conference Co-Chair
8:10	Keynote Speaker Jack Anawak, Member of Parliament, Nunatsiaq
8:50	Appreciation Mary Simon, Ambassador for Circumpolar Affairs/Conference Co-Chair
9:00	Adjourn for Evening Mary Simon, Ambassador for Circumpolar Affairs/Conference Co-Chair
9:10	Entertainment

Wednesday, October 9
Morning
(Astro Theatre)

9:00 a.m.	Welcome/Introduction of Panel 1/Review of Regional Discusssions Hon. John Fraser, Ambassador for Environment/Conference Co-Chair
9:10	"Contaminants in Our Lives: Overcoming Uncertainty" Chair: JoAnne Deneron, Canadian Polar Commission Mary Sillett, Inuit Tapirisat of Canada Norma Kassi, Council of Yukon First Nations Minnie Grey, Nunavik Regional Board of Health Ben Kovic, Nunavut Wildlife Management Board
9:50	Appreciation Mary Simon, Ambassador for Circumpolar Affairs/Conference Co-Chair
9:55	Questions/Open Discussion
10:15	Introduction of Panel 2/Review of Regional Discussions Mary Simon, Ambassador for Circumpolar Affairs/Conference Co-Chair
10:20	"Managing Northern Contaminants: Government/Citizen Initiatives" Chair: Michael Kusugak, Canadian Polar Commission Leslie Whitby, Department of Indian Affairs and Northern Development David Malcolm, Aurora Research Institute Barney Masuzumi, K'asho Got'ine Community Council Frank Anderson, Labrador Inuit Association
11:00	Appreciation Hon. John Fraser, Ambassador for Environment/Conferer. .e Co-Chair
11:05	Break
11:20	Introduction of Panel 3/Review of Regional Discussions Hon. John Fraser, Ambassador for Environment/Conference Co-Chair
11:25	"Northern Foods: Standards, Monitoring, and Consuming in Confidence" Chair: Jack MacKinnon, Government of the Northwest Territories Harriet Kuhnlein, CINE/McGill University Martha Flaherty, Pauktuutit Michel Fournier, Université du Québec à Montréal

Afternoon

12:05 p.m.	Appreciation Mary Simon, Ambassador for Circumpolar Affairs/Conference Co-Chair
12:10	Questions/Open Discussion
12:30	Lunch Keynote Speaker: John Amagoalik, Nunavut Implementation Commission
1:30	Introduction of Panel 4/Review of Regional Discussions Mary Simon, Ambassador for Circumpolar Affairs/Conference Co-Chair
1:35	"Communicating with Communities" Chair: Charlie Furlong, Director, Métis Nation of the N.W.T. Craig Boljkovak, Inuit Tapirisat of Canada Bruce Rigby, Nunavut Research Institute Roy Koerner, Natural Resources Canada
2:15	Appreciation Mary Simon, Ambassador for Circumpolar Affairs/Conference Co-Chair
2:20	Questions/Open Discussion
2:35	Break
2:50	Introduction of Panel 5 Mary Simon, Ambassador for Circumpolar Affairs/Conference Co-Chair
2:55	"The Public and Private Sectors in Environmental Protection" Chair: Jon Grant, Canadian Polar Commission Joe Kunuk, Inuit Circumpolar Conference Pierre Béland, St. Lawrence Ecotoxicology Research Centre André MacNeil, Qiqittaaluk Corporation
3:40	Appreciation Mary Simon, Ambassador for Circumpolar Affairs/Conference Co-Chair
3:45	Questions/Open Discussion
4:15	Adjourn for Afternoon Mary Simon, Ambassador for Circumpolar Affairs/Conference Co-Chair

Evening
(Discovery Lodge)

6:30 p.m.	Refreshments
7:15	Welcome/Introduction of Keynote Speaker Mary Simon, Ambassador for Circumpolar Affairs/Conference Co-Chair
7:25	Dinner Keynote Speaker: Jack Anawak, M.P., Nunatsiaq
8:00	Introduction of Keynote Speaker Hon. John Fraser, Ambassador for Environment/Conference Co-Chair
8:10	Keynote Speaker Hon. Stephen Kakfwi, Minister of Resources, Wildlife, and Economic Development
8:50	Appreciation Mary Simon, Ambassador for Circumpolar Affairs/Conference Co-Chair
9:00	Adjourn for Evening Mary Simon, Ambassador for Circumpolar Affairs/Conference Co-Chair
9:10	Entertainment

Thursday, October 10
Morning
(Astro Theatre)

9:00 a.m.	Welcome/Introduction of Guest Speakers Hon. John Fraser, Ambassador for Environment/Conference Co-Chair
9:10	"For Generations to Come: Canada, Contaminants, and Circumpolar Co-operation" Sheila Watt-Cloutier, Inuit Circumpolar Conference Terry Fenge, Inuit Circumpolar Conference
9:40	Appreciation/Introduction of Commentators Panel Hon. John Fraser, Ambassador for Environment/Conference Co-Chair
9:45	Commentators John Rayner, Assistant Deputy Minister, DIAND John Stager, Canadian Polar Commission Magnus Magnusson, International Arctic Science Committee

10:00	Appreciation Hon. John Fraser, Ambassador for Environment/Conference Co-Chair
10:05	Questions/Open Discussion
10:15	Introduction of Panel 6 Mary Simon, Ambassador for Circumpolar Affairs/Conference Co-Chair
10:20	"National Concerns and National Responsibilities" Chair: Jim Vollmershausen, Environment Canada Mary Simon, Ambassador for Circumpolar Affairs Jon Grant, Canadian Polar Commission Stas Olpinski, Makivik Corporation
10:40	Appreciation Hon. John Fraser, Ambassador for Environment/Conference Co-Chair
10:45	Questions
11:00	Introduction of Guest Speaker Hon. John Fraser, Ambassador for Environment/Conference Co-Chair
11:05	Summary and Recommendations Fred Roots, Environment Canada
11:45	Appreciation Hon. John Fraser, Ambassador for Environment/Conference Co-Chair
11:50	
Afternoon	
12:30 p.m.	Acknowledgements/Closing Remarks Hon. John Fraser, Ambassador for Environment/Conference Co-Chair
12:45	Adjourn

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